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## The Halford Oration.<sup>1</sup>

### CHAPTERS IN THE LIFE HISTORY OF CANCER.

By DAVID ARTHUR WELSH, M.A., M.D., F.R.C.P. (Edin.),  
*Professor of Pathology, University of Sydney.*

I HIGHLY appreciate the honour of being invited to deliver the second oration to commemorate the life and work of George Britton Halford on this, the one hundred and fifth, anniversary of his birth.

As I read the first Halford Oration<sup>(1)</sup>—that foundation which Professor Osborne has so well and truly laid for the superstructure of future orations—I was impressed by the fact that Halford must have been endowed with the three cardinal attributes of the scientific mind: (i) scientific insight to see into the truth of things, (ii) scientific imagination to reconstruct the whole truth so far as it can be seen and (iii) scientific honesty to have nothing but the truth. Insight, imagination, honesty are the finer instruments of research. All are needed to probe the secrets of living matter; but the most difficult to wield is honesty; it is so easy to see only what we want to see. Observation, experiment, inference are the cruder implements of science, necessary but supplementary to more delicate work.

In 1862, we read, Halford was selected as "a gentleman of suitable attainments to fill the Chair of Anatomy, Physiology, and Pathology"—a colossal undertaking even in those days, only sixty-seven years ago—an impossible undertaking now. In 1863 he delivered his first lecture in the first medical school to be founded in Australia, the University of Melbourne.

#### THE RENAISSANCE OF MEDICINE IN HALFORD'S TIME.

About that time, that is, about the middle of the nineteenth century, medical science had entered upon the most tremendous revolution in its history. It was a true renaissance of medicine, when medical science was born again and gained a fresh lease of life. All branches of medicine shared in that evolution; but pathology perhaps gained most because of its brilliant exponents. From 1846 onwards there appeared the rational pathology of Henle, the cellular pathology of Virchow, the chemical pathology of Ehrlich, the general and experimental pathology of Cohnheim (1877). In all that galaxy there is not a word of "morbid" anatomy. These men had a far truer conception of pathology than to use an expression which is anathema. For pathology, meaning literally the science of disease, has a much wider scope than its name implies. It deals with the reactions of living tissues to interference with their environment; and such reactions are more often helpful and protective than harmful and morbid.

Then the great work of Pasteur in revealing the world of the microbe and its activities made possible that revolution in surgery accomplished by Lister

after 1870. Pasteur's work was supplemented by the technical ingenuity of Koch who set an historic example of patience and perseverance in tracking down the bacillus of tuberculosis, making possible most of the subsequent discoveries in bacteriology and almost suggesting that every disease could be traced to a microbial cause. The older members of my profession will remember the frantic efforts that were made towards the close of last century to discover the parasite of cancer and the disappointment that resulted when claimant after dishonoured claimant was non-suited. It was similar to the later disappointment that followed the failure to find an immunity to all bacterial infections after the brilliant successes of Jenner's vaccination against small pox, Pasteur's antidote to hydrophobia, Behring's antitoxin in diphtheria and Ehrlich's monumental work on immunity based on his classical "side-chain theory."

Into that world of awakened scientific interest, of quickened scientific effort, of outstanding scientific achievement, came Halford at his prime; and he worthily filled his part as an original thinker and worker, particularly in the domain of experimental medicine.

It is difficult for us now to realize the chaotic state of medical knowledge that existed before that time when Virchow published his "Cellular Pathology."

He proceeded to rebuild pathology on his true conception of the human body as an organised cell state, a social system of continuous development in which each microscopic unit performed its part. All fields of pathology were cleared by the new knowledge—inflammation, tumour growth, degeneration . . . . The physician of today can scarcely conceive how great a revolution this was. One who from his earliest student days has heard every phase of anatomy, embryology, neurology, physiology and pathology discussed in terms of cells, can hardly picture a state of medical knowledge in which these cells had no part.<sup>(2)</sup>

I quite agree that we who try to work out medical problems, too often unthinkingly take for granted what we owe to the past; just as we all take for granted, without fully realizing what it means to us, that inestimable privilege of having been born into the British race.

#### HOW OUR BODIES ARE BUILT, HOW THEY WORK AND THE PRICE WE PAY.

The opening phases of that great awakening of medicine were made possible by the development of the microscope as an instrument of research. The microscope shows that those wonderful houses which for a time we inhabit and which we call our bodies, are not built of shapeless slabs of protoplasm, but are built of delicately fashioned cells or bricks. Indeed the shape of many a cell is like that of a brick. Placed side by side, it would take about two thousand average cells to measure one inch; so that they do not become clearly visible until they have been magnified about one hundred times. The kitchen regions, where the food is prepared for the rest of the body, are built of kitchen bricks and house the kitchen workers who form part

<sup>1</sup> Delivered at Canberra, November 26, 1929.

of the kitchen walls. The great chemical laboratories of the body are known collectively as "glands" and are built of secreting cells or bricks which manufacture elaborate and often elusive chemical substances without which we could not live. They include the thyroid gland and its wonderful team work with many other glands throughout the body. That great pumping station, the heart, is built of interlacing cylinders, the muscle cells of the heart wall which pump the blood to all parts of the body, which never rest perhaps for seventy-two years with seventy-two beats per minute; for, when our hearts rest for a few seconds, we rest for ever.

Above all stand the human brain and central nervous system, built up of nerve cells and nerve fibres so intricately interwoven that much of it is still a *terra incognita*. It is not only the great executive chamber and central exchange which coordinates all our movements, which interprets all our sensations, which in some mysterious way is the first condition of all our thinking, but it is also the seat of greater mysteries, being the first condition of consciousness and the medium through which we see, as in a glass darkly, the eternal verities—goodness, truth, beauty—for, when the brain becomes clouded, then consciousness and insight become clouded too.

Hence the cell is still the unit in which research must centre. For each cell is a living thing which can be stimulated to work, to prepare food, to form secretions, to pump the blood, to use the brain. But we must also look beyond the cell to the things that move it to action and we find at work chemical and physical agencies and those unknown influences that we call vital.

#### **When Things Go Wrong.**

For a time all goes well with this commonwealth of cells that work in harmony throughout our bodies. But there comes a time when something goes wrong with a group of the cell workers. Then there is a rush on the part of other special cells (police and ambulance cells) to render first aid and to restore the damage. The resulting commotion may upset the whole body for the time being and we call it disease, although in reality it may be a carefully organized and usually successful attempt to resist invasion by some noxious microbe which has had the audacity to intrude.

Again, perhaps a few cells rebel and refuse to work and that may lead to cancer. At first they do no great harm, except when they impede the work of more important cells. In any case they are parasites and a drain on the house that feeds them. Like other degraded beings, they breed until they may form a large colony or tumour mass. That is the more innocent or simple type of tumour (newgrowth).

Then there is a worse type of cell, full of mischievous activities, damaging the rooms, often tearing down the walls, perhaps not deliberately trying

to destroy the house, but destroying it just as effectively nevertheless. That is the malignant or destructive type of newgrowth, of which cancer is an example. It is probably a form of misdirected energy; so that, if we could direct the precancerous activities of those cells, we might avert the cancer. And there are all degrees of hurtfulness in the life histories of different cancers. It may be news to many of you that not every lump within the body is a tumour growth, not every tumour growth is a cancer and not every cancer is equally dangerous.

#### **The Making of the Bricks.**

One of the great controversies, not of the ancient world but of the world of yesterday, centred in the question how those cells or bricks are made of which our bodies are built. One school of thought held that they could be made out of dead matter, as the brickmaker moulds and fires the clay. But here our analogy breaks down. The Architect of the Universe has designed a more wonderful way of making those bricks. He has designed the living body so that one brick or cell can make other bricks or cells; and, so far as we can tell, there is no other way. The human body is built up of countless millions of individual cells—the cells that make the brain, the heart, the blood, the bones, the muscles and every other organ and tissue of the body—and all that vast multitude of living cells are the direct descendants of a single cell, the fertilized ovum with which each human life begins. "*Omnis cellula e cellula*" was the form in which Virchow crystallized that scientific truth.

Nevertheless the cancer cell is not a cancer cell from the beginning. It was originally one of the cells of our bodies. But by some peculiar kink in its development or by some shock received during its life history it took the wrong turning and became a cancer cell. Then one cancer cell gives rise to other cancer cells and so the mischief spreads. But always one cell is derived from another cell, although the type of cell may change.

#### **The Price We Pay.**

Inseparably bound up with the wonderful structure of our bodies and with the marvellous work that they do—not the work that we do, but the work that our bodies do, whether we are working or playing or resting or sleeping—inseparably bound up with all that are the great mysteries of pain and disease and death. And the question arises, could not the great Architect have so made the world that unnecessary pain and untimely death were unknown? The answer to that question I do not know. But this thought occurs to me—that we would not be what we are without those possibilities of disaster. That delicate equipoise of mind and matter that we know as ourselves might lose something of its delicacy, something of its wonder, if it were cast in a more rigid mould from which all possibility of pain and disease was excluded.

The truth is that we must pay for our privileges. For the privilege of becoming a highly organized, delicately sentient, living human being we must pay; and part of that price is pain. When you see a worm writhing in the dust, you may think it is in pain. But pain, as we know it, is unknown to the worm. It is only as we rise in the scale of life and as our brain and our nervous system develop that we begin to feel pain. Without a brain to interpret pain, there can be no sensation of pain.

The invertebrate animal kingdom (the worms and snails, the flies and mosquitoes) are wholly free from pain. Cold-blooded vertebrates (fish and frogs) are relatively insensitive to pain. It is only among the warm-blooded vertebrates that anything approaching pain, as we know it, becomes possible. Man with his higher brain, knows pain as no other creature knows it. Now the liability to cancer follows this sensitiveness to pain throughout the ascending scale of animal life. Among invertebrates cancer is unknown. In cold-blooded vertebrates it is uncommon. Its frequency rises as the warm-blooded vertebrates rise in the scale of life, until it attains a maximum in man.

Hence cancer is one of the penalties that we must pay. Not for our advancing civilization, not for our mode of living (except in so far as our indiscretions may predispose to cancer), but for our higher biological development we must pay and part of that price is cancer. It is some compensation, however, that with our higher development there goes a higher brain which we should use to better purpose in order to combat cancer and to advance cancer research.

#### CANCER RESEARCH AND WHAT IT MEANS.

It is obvious that the first step in any campaign against cancer is to try to understand what cancer is. When we have to fight an enemy like cancer, we must try to discover the secret of that enemy's success, to estimate his strength, to anticipate his moves, to frustrate his designs. That, in brief, is the object of all cancer research. But it is not enough for the success of our campaign that scientists and doctors alone should try. Modern warfare is not waged by the professional soldier alone: whole peoples are engaged. Hence we must all try to reach as full and true a conception of the cancer process as it is possible for each of us to reach and then—we must all do our bit.

But there are many different ways of looking at the problem of cancer and the different forms of experience and of training that each of us has had, will naturally influence our outlook. For that reason the conception of cancer that each of us has acquired, is bound to be somewhat distorted, according to the bent that each has followed. The mental pictures that we have formed of the cancer process, are bound to differ, each of our pictures representing some partial presentation of the truth—and probably much error. The more we know about cancer, the

less likely are we to be dogmatic, recognizing the limitations and imperfections of our knowledge.

In what I have to say to you, I mean to pay my non-medical audience the compliment of trying to face the difficulties of a difficult subject, and I ask you to note, as the life history of cancer is unfolded, how often hope shines through the darkness of our ignorance.

#### Microscopical Research.

Microscopical work is the basis of all cancer research. It does what it has always done. It enlarges the vision of those who can see. It reveals the life history of the cell. And the cell is still the fundamental unit in all cancerous processes. It is true that the microscope does not reveal other vital processes, notably those intracellular biochemical and biophysical reactions which are more fundamental still, in the sense that they initiate all cell activity. Nevertheless the microscope, in unfolding the life history of the cancer cell, states the problem of cancer for the biologist, the chemist and the physicist. Without the guidance of the microscope workers in other sciences would not know what they had done nor what they had to do.

It is with microscopical work and the cell life that it reveals, that I am at present concerned. The phases of cancer life that I have specially studied include (i) the graded or relative malignancy of newgrowths and the fact that cancers are not all equally dangerous, (ii) the influence of biochemical stimuli in exciting the origin of the great glandular cancers (and the comparative limitation of irritational causes to cancers arising from the surface cells of the body) and (iii) the influence of a cancer-promoting substance in determining the extension and spread of an established cancer, indicating that, once a cancer has started to grow, it derives an impetus to further growth from within itself. I shall come back to these points later.

#### Ultramicroscopical Research.

Within recent years there has been discovered a world of living things that are beyond our microscopical vision. They never have been seen and we know that they never can be seen so long as light retains its present wave length and they their present size. Some of them hover on the border line of visibility. They are the ultramicroscopical microbes—the world of life invisible. Because they can pass through the pores of very fine filters, they are also known as "filter-passers" and as "filterable viruses." They are the cause of mumps and measles, of epidemic influenza and the common cold, of small pox and chicken pox, of infantile paralysis which cripples too many children, and many other microbial infections of man and beast (including foot and mouth disease in cattle and distemper in dogs) all characterized by their epidemic tendency and high infectivity.

Now the difficulty is this—that there are also known to exist growth-promoting substances, some

of which are formed by ferment action within our bodies, which are filterable and invisible and which can in some unknown way multiply themselves like these ultramicroscopical microbes and filterable viruses. And the problem is: How can we distinguish those growth-promoting substances from true viruses? At present we must admit that there is no test known that can be used to make a scientific distinction between them.

The same difficulty is met when we try to define our cancer-promoting substance. It might be a microbe, but the evidence is against it. Cancer is preeminently an individualistic reaction. It is highly infective to the individual in whom it grows; it never has been known to be in the slightest degree infectious or contagious to other persons.

#### Immunological Research.

Immunization against cancer has always had a great fascination for the worker in cancer research; it would be such a wonderful achievement if one could establish an immunity to cancer. It is more than twenty-five years ago since I began the attempt, using injections of desiccated and pulverized cancer cells, but I met with indifferent success. Before and after that time many other workers tried in many different ways, but only partial successes have been recorded.

#### Physical Research.

The Cancer Research Fund of the University of Sydney is chiefly concerned with the modern development of physics—with those brilliant analyses of the ultimate constitution of matter and with the release of forms of radiant energy hitherto unsuspected and uncontrolled. Now when the physicist can toy with the atom and can so bombard the atom that he can penetrate between its component electrons and protons with selected  $\alpha$  and  $\beta$  particles and  $\gamma$  waves of calculated velocity and energy, then indeed all things become possible. Those developments of physics and their applications to medicine are only in their infancy. It is possible that we now living shall yet see the dawn of such an evolution of medicine as shall transcend the great discoveries of the past. It is probable that that evolution will be first manifested in the control of cancer. It is greatly to the credit of the Directors of Cancer Research and of Treatment in Sydney that from the beginning of their work, now dating many years back, they stressed the value of physics in the solution of the cancer problem.

They have planned an attack on the cancer cell, not because it is a specialized form of cell, but because it is a specialized form of matter. It is hoped that the material constitution of the cancer cell will prove to be such that it is vulnerable or sensitive to forms of radiant energy to which normal tissue cells are immune or resistant. Even if the cancer cell is not naturally vulnerable, it is hoped that ways and means can be found of render-

ing it vulnerable to this or other means of attack. The method is full of promise. It has already achieved such a measure of success that radium and X rays now vie with surgery as our chief line of defence against cancer.

#### Treatment and Research.

To the Commonwealth Government we are indebted for radium to the value of £100,000 to enable this great work to be carried on throughout Australia. The Government recognized that cancer research is not antagonistic to cancer treatment. Rather must treatment be animated and ever guided by research. All our present methods of treating cancer fall lamentably short of what we should like them to be. Our hope is that cancer research will open up fresh avenues of thought and that, when these have been thoroughly explored, they will lead to better means of treatment or better still to means of preventing cancer.

All the world over workers in all departments of science are writing the life history of cancer, so that modern cancer research now covers an immense field and the work is often highly technical.

#### THE LIFE HISTORY OF CANCER AND TUMOUR GROWTH.

The principal chapters in the life history of that living thing which we call cancer, include: (i) the essential nature and ultimate cause of cancer, (ii) its antenatal pathology or precancerous development, (iii) the birth of cancer, that is, its origin and causation, (iv) the growth of cancer, including its extension and spread and (v) the decline and death of cancer. Lastly we come to those practical chapters on the prevention and cure of cancer. Again I ask you to note how means of prevention are indicated at almost every stage of its life history.

#### On the Essential Nature and Ultimate Cause of Cancer.

What is it that starts the cancer cell on its malignant career? What extraordinary impulse is implanted in a group of cells to make them run amok throughout the body? We do not know. Under the microscope we can see the birth of a cancer, we can see it grow, we can see it spread, we can see it invade and destroy the healthy tissues, we can tell cancer cells from tissue cells, we can classify and grade the different types of cancer and tumour growth. Whole chapters in the life history of cancer are open to our view. But the chapters that we are most anxious to read, are closed.

These are the chapters on the ultimate cause and on the essential nature of cancer. Perhaps the analogy that is easiest to follow, is to look upon cancer as a local rebellion of a group of discontented cells within that commonwealth of working cells which form the human body. The rebellious cells throw off all restraint; and, if the local riot be not promptly checked by heroic measures, it may develop into a generalized invasion which destroys the whole commonwealth.

But what is it that generates this discontent and excites this rebellion? It may be that some evil foreign influence has entered into the lives of those cells, changing their character and transforming them from law-abiding workers in a great commonwealth into lawless destroyers of that commonwealth. That corresponds with the hypothesis that cancer is caused by a special and external cancer parasite, of which, however, there is no certain proof, though there has been some support from recent work. The fact that cancer is non-infectious has always been a difficulty in the way of that hypothesis.

The truth is that the only known parasite of cancer is the cancer cell itself. Indeed every new growth or tumour growth, whether it be cancerous or non-cancerous, is a new birth of cells, each of which is parasitic upon the parent organism. The only difference between cancer and non-cancer is that the former is more invasive and more destructive than the latter. That parasitic character distinguishes newgrowth or tumour growth from all other new formations of tissue and gives it a unique biological position. The extraordinary fact is that this newgrowth or parasite is the immediate offspring of the cells of the human body. It is not introduced from without; it is generated from within. In the most literal sense, therefore, the cancer parasite is the cancer cell; and, so far as we know, there is no other parasite of cancer.

As I have said, there are many different ways of looking at the cancer problem, and another possibility is that cancer may represent a perverted striving for immortality on the part of discontented cells which turn and bite the hand that feeds them. It may be that, when a group of cells becomes useless and aged, whether prematurely from various causes or naturally from lapse of time, those cells obey a blind impulse towards an independent existence and seek to perpetuate themselves without regard to the other cells of the body. Instead of sharing a regulated renewal of vigour, they are stampeded into a wild *sauve qui peut*. They become a disorderly and panic-stricken rabble, liable at any time to spread havoc throughout the commonwealth on whose well-being they depend for life itself, and thus to precipitate the very disaster that they seek to avoid. If the cause of cancer should be found in some blind biological impulse like that, then it may prove difficult to control that impulse. But many biological facts depend ultimately on biochemical factors which it may not be so difficult to influence and to control.

The conception of cancer towards which I am most strongly inclined, is that the development of cancer within the human body may not be so purposeless as we are apt to imagine. Cancer may be the expression of some need which develops most often as age advances; so that, if we could understand that need and could do something to satisfy it, then we might be able to prevent the growth of that cancer. Perhaps we take too much for granted

in assuming that cancer arises independently of the needs of the rest of the body. Its objects may be compensatory and defensive, although its results are disastrous. Now that is an important conception, because, if it should be true, it indicates one of the ways in which it might be possible to prevent and to control cancer. There is indeed much evidence in support of this view, particularly in the genesis of that most important group of cancers, the cancers that take origin from the glands or chemical laboratories of the body.

#### On Precancerous Processes or the Antenatal Pathology of Cancer.

We cannot dissociate the life history of the true cancers from that of other forms of tumour growth, for, though strictly speaking they are not all cancers, yet they are all more or less closely related to cancer and separated from all other forms of cell reaction and cell growth that are known to pathology. Now that just shows how difficult it is to make any positive statement about cancer, because even that is not quite true. Although we recognize that the processes of cancer (and of tumour growth in general) represent a unique biological phenomenon which is difficult to understand, yet we also know that they are intimately related to other pathological processes which are not unique nor difficult to understand.

These are the cell reactions and cell processes which precede the onset of cancer (and tumour growth) and which are therefore known as precancerous. These precancerous reactions of tissue cells take the form of overgrowths (which are not yet true newgrowths) of cells due to the action of some external irritant or of some internal biochemical stimulus. Fortunately, only a few such overgrowths turn to cancer; nevertheless most of the greater cancers develop from some such preliminary overgrowth of cells which are not yet cancer cells. That fact indicates that there is a stage in the life history of most cancers when they are neither normal cell nor cancer cell. They are betwixt and between. Hence the first chapter in the life history of a cancer is not its birth, but its antenatal or precancerous development. The life of every living thing begins before it is born and cancer is no exception to that rule.

A study of precancerous processes and of the precancerous state is therefore vital to the cancer problem. It represents the antenatal pathology of cancer. But it would take us into far too technical detail to follow it up now. Yet you can see how it opens up avenues of research and how it holds out hopes for the ultimate prevention and control of many forms of cancer.

#### On the Origin and Causation of Cancer and Tumour Growth.

The one thing certain in the causation of cancer is that there is no single and specific cause of cancer as yet known. Hence, when we speak of the "causes" of cancer, we mean only certain pre-

disposing and accessory factors which in some way not understood are related to the origin of cancer. These causes include (i) hereditary predisposition, (ii) age and senescence, (iii) embryological faults, (iv) irritation and injury and (v) biochemical stimuli. Then there are other reputed causes which, I think, we must exclude, for example, our diet, our civilization and an extraneous cancer parasite. Now we find that different cancers (and different forms of tumour growth) are due to different causes or rather to different combinations of those causes. More often than not those causes are linked together in definite relations to give rise to different forms of tumour growth. Such a concatenation of causes is seen when the strong Australian sunlight irritates the lightly pigmented skin of fair haired elderly persons to cause those sluggish types of skin cancer included in the term "rodent ulcer." That is one of the simplest propositions in the prevention of cancer that could be stated.

#### *Heredity.*

In regard to the direct influence of heredity on the development of cancer, there is evidence that mice and men are linked in a strange fraternity. Both mice and men may show strains that are relatively susceptible and strains that are relatively immune to cancer. Fortunate indeed are they who belong to the latter class. And to those who belong to the former class, that is, to those who have a family history of cancer, I would say that forewarned is forearmed. It is one of the prerogatives of intellect to be able to turn what at first appears to be a menace into a weapon of defence against that menace. If we accept the fact that heredity plays a part in the genesis of most cancers, then we should be in a better position to prevent death from cancer, because our attention would be focused upon their early and curable stages when an hereditary predisposition is known to be present, and, further, we should concentrate upon prevention in such cases by removing all possible exciting causes.

#### *Age and Senescence.*

The influence of age in determining the onset of cancer is definite and strong. Cancerous growths may develop at any age, even before birth, but the liability to cancer increases as age advances or as the tissues become worn out (senescent). Modern medicine has made wonderful progress chiefly in the direction of preventing disease and thus of prolonging life. The life of civilized man has been lengthened by some ten or fifteen years which are not years of palsy and decrepitude, but years of ripe experience and fruitful work. They are, or ought to be, the best years in most lives and they are the years on which cancer concentrates its attack.

For, in extending life, preventive medicine has also extended the period in which cancer operates most disastrously. The risk of cancer becomes greater with advancing years and much of the

increasing death rate from cancer is due to this extension of the cancer age. What medicine has given, cancer is taking away. We have not yet reached that impasse where the waste of cancer equals the gain of medicine. But we have reached a stage where cancer is proving to be the greatest obstacle to the progress of medicine and the greatest destroyer of human life at its best.

#### *Embryological Faults: Embryonic and Mature Tissues of Origin.*

An embryological "fault" may be the starting point of a tumour growth, though rarely of a cancer. When you remember that all the complex structures of our bodies have been built up from the descendants of a single cell, the wonder is that faults in the building are not more common. Yet it is not uncommon for a group of cells to be displaced or overlooked in the development of the body. Nor is it uncommon for a tumour to grow sooner or later from such an embryonic residue. We do not know what awakens a dormant group of residual cells from their embryonic slumber; but in any case most tumours of that type are relatively innocent; only a few are highly dangerous.

All the great cancers that take the heaviest toll of useful human life, with rare exceptions take origin from mature cells which have already done good work for the commonwealth of the body. That fact suggests that the exciting causes of those great cancers are not inherent in the cells from which they grow, that these causes were not conceived in remote cell life within the womb, but that they are of later development and probably do not begin to operate until adult life when the cancers appear. That means that the causes of the greater cancers should be more easily investigated and determined and cancer thus more easily controlled and prevented. To a great extent this statement already does apply to the cancers that are excited by specific external irritants; to a less extent it also applies to the cancers that are caused by biochemical excitants, though here again there is both scope and hope for cancer research.

#### *Irritation and Injury.*

It is safe to say that many cancers would never have arisen had greater care been taken to protect the tissues from local irritation and damage, though it is not known how those causes act. The man who cherishes an unhealing sore in his mouth or who irritates his stomach with too hot or too pungent food or drink, is simply extending an invitation to cancer. In other parts of the body, cancers may be started in much the same way, though fortunately the great majority of sores and hurts never turn to cancer. Irritation is undoubtedly the commonest "cause" of the cancers that take origin from the external and internal surfaces of the body (the skin and the alimentary tract).

Much has already been done and much more could be done to insure protection against those surface cancers by eliminating sources of irritation. The first workers with radium and X rays often

developed cancer, because they did not protect themselves, never realizing that those forms of radiant energy which could kill cancer (when allowed to act in one way) could also cause cancer (when allowed to act in another way). Many other physical and chemical agencies are known to excite cancer. Indeed so conclusive is the evidence against certain irritants that several occupational cancers are now recognized and the workers are protected against them by law—a most important step in prevention.

#### *Biochemical Stimuli.*

A biochemical (hormonal) stimulus can be traced in the origin of the great glandular cancers. The tremendous influence of the biochemical laboratories of the body (the team work of the glands) in regulating the work of all the cells of the body, has long been recognized. But it is not generally recognized that biochemical excitants probably exert no less an influence upon the origin of cancer within those somatic laboratories, that is, upon the origin of the glandular cancers in particular and probably upon the origin of many other cancers as well. Irritation in the ordinary sense of that word can be definitely excluded from most of the glandular cancers; and so also can embryonic faults, for it is in mature working tissues that those cancers arise.

Age and heredity, however, contribute their quota to the genesis of the glandular cancers. For there are definite age periods at which certain biochemical stimuli are most potent, and there are age periods marked by the cessation of biochemical activity at critical stages in the life history of the cells concerned in the cancer process. Again, there is evidence that types of chemical laboratories are inherited, stable or unstable, potent or less potent, durable or less durable. In the exploration of those biochemical "causes" of cancer there is a difficult undertaking but a hopeful outlook for research.

#### *Discredited Causes of Cancer.*

Not the food we eat, but the way we eat it, may give rise to cancer. Grass eaters (horses and cattle), flesh eaters (dogs and cats) and mixed eaters (man), all are subject to cancer. A vegetarian diet does not protect against cancer, neither does a flesh diet predispose to it. Many animals in domesticity are saved from cancer because we kill them for our food before they reach the cancer age.

Nor can our civilization be blamed for our cancers, because the primitive races of mankind are also liable, probably not to the same extent as we are, for three reasons: (i) because we have acquired certain injurious habits which I need not specify, (ii) because we have reached a higher biological development with its attendant penalties and (iii) because we attain a greater average age and thus prolong the cancer period.

The remedy that will at once occur to some minds is to go back to primitive life, to withdraw from civilization. I am in sympathy with that remedy so far as it means the reform of some of our hurtful

habits. But to turn down our rich inheritance of civilized life is to turn back the hands of the clock. The real remedy is to turn back the onslaught of cancer.

#### *Cancer is neither Infectious nor Contagious.*

We have seen that although cancer is a parasite because it preys upon the body of its host, yet there is no proof that cancer is caused by any external parasite. Indeed there is strong evidence against any microbe being the cause of cancer and that evidence discloses another chapter in its life history, because cancer is neither infectious nor contagious. Now that is a very remarkable fact. Doctors have handled cancers throughout many hundreds of years. Nurses and friends have been in close and constant attention upon cancer patients. Yet there is not in the long history of medicine one single authentic case on record of cancer having been transmitted from one person to another. Cancer patients, cancer houses, cancer hospitals cannot be blamed for spreading the disease.

If cancer had been an infectious disease, the problems of prevention and of cure would have been immeasurably easier to solve and the cause of cancer might have been discovered long ago. Diseases may be classified into the easily preventable and the not easily preventable. The easily preventable diseases are due to agencies that attack our bodies from without; the not easily preventable are due to more subtle causes that develop within the living body. Most forms of cancer belong to the latter class and that is the chief reason why the cause of cancer has so long remained obscure and why most cancers are so difficult to prevent. The few cancers that can be traced to known external irritants, can be more easily prevented, as we have seen.

#### *On the Growth and Spread of Cancer.*

##### *Invasive Growth and Spread.*

Every one who has studied cancer, knows that the new-born cancer grows by the subdivision of its cancer cells to form more cancer cells and that the cancer spreads by the dissemination of its cancer cells which invade the near by tissues (the local invasion) and then may travel far and wide along the blood and lymph vessels of the body and settle in distant parts to give rise to secondary growths of the same cancer (the generalized invasion). The great danger in cancer comes from that invasive spread of the cancer cells. But the rate at which the invasion develops, and the destructive energy of the invading cells vary greatly in different cancers and that is the chief reason why some cancers are much more dangerous than others. In any case the time is short, the invasion is progressive, so that the opportunity for successful cure soon passes. Nevertheless the opportunity has been there.

##### *Contact Growth and Spread.*

But that is not the only way in which an established cancer grows and spreads. For, side by side with the marginal cancer cells, lie the working tissue cells of the part and the very remarkable

fact is that these adjacent tissue cells sooner or later become contaminated by contact with the cancer cells, so that they too become cancerous just where they lie. Some malign influence passes from the cancer cells to the nearer non-cancerous cells, forcing these healthy cells to pass through definite precancerous stages until they too become cancer cells.

Then these new-formed cancer cells begin to behave like the original cancer cells. They multiply by subdivision, they spread by invasion and they pass on to the next tissue cells that extraordinary cancer stimulus which they had acquired from the earlier cancer cells. Thus a neglected cancer is continually extending its field of operation by infecting cell after cell with cancer. A process of recruitment is continually going on, reminiscent of the days when the historic press gang terrorized the seaport towns of England, with this sinister difference, however, that whereas the press gang forced reluctant men to serve their country, this cancer stimulus compels the law-abiding epithelial cells to join forces with the enemy which is cancer.

Whatever may have been the original cause of the cancer (whether external irritant or internal biochemical excitant), the continued growth and spread of the cancer is largely due to something that comes from the cancerous growth itself. What that something is, we do not know. We have already noted that it is possibly, though improbably, some form of ultramicroscopical microbe or filterable virus. The evidence is strongly against there being any such form of cancer parasite. We must be content in the meantime to label it an extraordinary cancer-promoting substance or stimulus, more or less analogous to certain growth-promoting substances that are known to exist.

Whatever may be the cause, the disquieting fact remains that, once a cancer has started to grow, then a powerful stimulus to further cancer growth comes from the cancer growth. That means that the mere presence of cancer within the body is more highly dangerous than has been realized. We have long known that the growth and spread of cancer is progressive, that a cancer creates more cancer by its invasive growth and spread. But we do not always recognize that the danger is cumulative, that cancer creates more cancer and extends the cancer area by this form of contact spread. If any small cancer area is destroyed at an early stage in its life history, then the adjacent healthy cells will probably never become cancerous, but if that small cancer be neglected, then almost certainly the surrounding cells will become cancerous also. That is an added danger to which every cancer patient is exposed. It provides an additional argument, if any were needed, for the complete eradication of cancer at the earliest possible moment.

#### On the Decline and Death of Cancer.

Although the decline and death of cancer is the shortest chapter in the life history of cancer, it is

one of the most significant. A cancer is a living thing and, like all other living things, it cannot live for ever. A few cancers reach the term of their natural life before they kill the patient. Every doctor who has had much experience of cancer, can recall instances where a cancer appears to have been checked in its malignant career, where it has ceased to grow and where it has died out. What sometimes happens is this: the doctor declares with truth that an advanced cancer is hopelessly inoperable and that he can do no more; the patient in desperation tries some quack remedy. Then the incredible thing happens; the cancer begins to die and the patient begins to live again. Alas! that is an event too rare to be of any practical value. Not one in a thousand cancers, perhaps not one in ten thousand, are so obliging as to die before they kill their human host.

Nevertheless it is a very precious fact that cancers have been known to die, however rarely that may happen. It means that cancer may suffer a natural exhaustion of vitality or that some cancers are born, as many children are born, with a low order of vitality.<sup>(3)</sup> It should encourage research to help cancer to die. One of the main objects of cancer research is to find some means of accelerating that exhaustion of cancer vitality and of precipitating the death of cancer. Radium and X rays are the most powerful weapons we possess for arresting the progress and accelerating the death of advanced inoperable cancer. Injections of colloidal lead have been used with inconstant results. Artificial immunization against cancer has been tried in many ways over many years and some of the results are encouraging. But we dare not say more than that. We must admit that we are still very far from that ideal where we can destroy any cancer cell at will.

One of the most important conclusions to be drawn from those chapters on the life and death of cancer is that cancer is a thing to be fought and that it must be a fight to a finish. What that finish will be, will depend partly on the doctor and partly on the patient and partly on the cancer itself. I could tell you tales of cancer that read like a romance. How cancer cells have lain dormant in the body for very many years and then were roused to active malignant life. How a patient, dying of advanced cancer, began to find the cancer dying too, so that the patient gained an unexpected lease of life. How a cancer of the tongue was removed, but secondary growths appeared in the neck again and again and again; how each recurrence was carefully removed and how that patient is alive and well now, eight years after removal of the last recurrence, the "moral" to my tale being never to give up hope.

#### THE IMPORTANCE OF BEING EARLY.

We are too apt to allow ourselves to become obsessed by our ignorance of cancer and by our helplessness in dealing with it. But when we come

to take stock of our knowledge and of our control of cancer we find that, while there is truth in that attitude of mind, it does not represent the whole truth. The truth is that much of the life history of cancer is an open book. The pity is that doctors and patients alike do not always know how to read that book to the best advantage. If only they would make a better use of the knowledge that we have already gained, then it should be possible to do more to prevent the development of some cancers and it should be possible to do much more to prevent death in many forms of cancer.

#### The Cure of Early Cancer.

If there is one fact of which we have clear and certain knowledge, it is that early cancer is often curable. Yet in this enlightened age one is astounded at the extent to which patients will allow cancers to grow before they seek advice. They hesitate and hesitate until they are indeed lost; for then they drift into a danger from which it may be impossible to save them by any form of treatment. Whereas, if they had consulted their doctor at an earlier stage and if the doctor had known what to do, a tragedy might have been averted. The experience of all who have had dealings with cancer, is darkened by those tragedies of the "too late." I do not hesitate to say that many of the deaths now credited to cancer should more properly be ascribed to neglect.

One reason is that cancer casts an unreasoning dread over its victims and that dread makes them reluctant to seek advice until it is too late and the time for cure has passed. There is the dread of the cancer itself and the hope that the suspicious sign will prove not to be cancer after all, if only you wait long enough. But that is the one thing you cannot do: you cannot wait.

Everyone knows that cancer is incurable, when it has been allowed to go too far. And it is often allowed to go too far because of that unreasoning dread which paralyses the will, and because of that false hope which prevents timely action. Much of that dread would vanish if the patient grasped the truth that early cancer is far from being the hopeless thing that late cancer unhappily is. On the contrary, in most of its common positions in the body, early cancer is wonderfully curable, even by the imperfect methods at our command, when those methods are rightly used.

It is one of the bright spots in our experience of cancer that the earlier the treatment, the greater is the chance of cure, and that in all early cases there is indeed great promise of complete cure. Many persons are known to be alive and well today, long after an early cancer has been removed. And of those who have succumbed to cancer, many more could have been saved if the cancer had been removed at an earlier stage. I am convinced that even now we can do something to prevent cancer and we can do much more to prevent death from cancer, if the patient and the doctor do the right

thing. Two conditions must be strictly observed: (i) The cancer must be identified with certainty at the earliest possible stage in its life history and (ii) the treatment must be perfectly adapted for that particular type of cancer. For, as I have explained, there are cancers and cancers.

One word of gravest warning I must give. The diagnosis of early cancer and the treatment of early cancer both demand the highest skill of which the medical profession is capable. Do not, therefore, I entreat you, waste the precious moments during which alone a cure is possible, in seeking unskilled advice or in trying quack remedies. That is but a form of suicide—slow but sure—for delay spells death.

#### The Signs of Early Cancer.

The beginning of a cancer is always obscure. It is an insidious growth, well camouflaged. Often we have no means of detecting the cancer process until it has well begun, but we should be able to detect it with certainty before it has become well established. Many early cancers do not form a tumour in the sense of a lump or mass that we can see or feel, and most early cancers are painless. Yet a danger signal is always flown—the red flag of hemorrhage, the lump in the breast, the unhealing sore about the mouth, the persistent indigestion and so on. Now when those danger signals of cancer appear, then both patient and doctor must be on their guard. A danger signal is a warning, given in order that an accident may be averted. Here the accident that we seek to avert is an unnecessary and preventable death from cancer.

It is a source of comfort, as well as a source of danger, to know that not every bleeding, not every lump, not every sore is caused by cancer. Indeed the greater number of such signs are due to conditions which are not cancerous, but which may become cancerous when they are not properly treated. Two great opportunities are given when first these danger signals appear: (i) If they are due to early cancer, opportunity is given for the cure of that cancer and (ii) if they are not due to cancer, opportunity is given to prevent cancer. The great danger comes when the patient or the doctor gambles on the chance that the suspicious sign may not be cancer or may never become cancer and takes no further trouble to make certain one way or the other. That is a danger which every patient and every doctor should face frankly and bravely, for the doctor, too, needs courage as well as special training.

#### CONCLUSION: COURAGE AND HOPE.

There is a type of courage which commands sincere respect; it is the type which faces death bravely when death is seen to be inevitable. The men and women of our race have never failed in that. But there is a higher type of courage which is born of higher ideals of responsibility and of duty, which loses nothing of its high idealism by

being linked to common sense. That higher courage will face the possibility of cancer at the earliest threatening sign, will resolve to have all doubt resolved and will take up the fight against that enemy of mankind. That is the type of courage that we hope to foster by putting before you such facts as I have given tonight, such facts as, I trust, will lead you to a better understanding of the cancer process and to the realization that the sufferer from cancer is never without hope, though hope hangs by a slender thread when hesitation grows the cancer.

So I end on a message of hope and an appeal for help. For we doctors need the help of our patients in fighting the scourge of cancer just as much as they need our help. My appeal for help is made to all who are suffering or who have yet to suffer from cancer, that they should show courage and common sense when the first shadow of a suspicion of cancer falls across their lives, that they should give us the chance of dealing with cancer in its earliest curable stages. Only by the courageous and intelligent cooperation of patient and doctor and by the education of both in the lessons of cancer research can we hope to succeed in that campaign against cancer in which the whole world stands united.

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#### CANCER OF THE STOMACH.<sup>1</sup>

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THIS common and dreadful disease, cancer of the stomach, presents many problems in diagnosis. The cause is unknown and its cure in the present state of our knowledge is almost always impossible.

#### Aetiology.

It is a disease of late middle life, rare before thirty and unusual after seventy. Twice as many males as females are affected. Its more frequent occurrence in males, as well as their greater susceptibility to cancer of the lip and tongue, balances the prevalence of cancer of the uterus and breast in women, so that the incidence of cancer as a whole is almost the same in both sexes.

The most recent contribution to the aetiology of cancer is that of A. F. Hurst. He believes that the majority of carcinomata of the stomach are the consequence of a previous, often symptomless gastritis, characterized by achlorhydria. Thus he

regards the achlorhydria usually associated with cancer as a preexisting condition and not as failure of function due to the cancer. In support of this he points out that in those patients in whom hydrochloric acid is found in the gastric juice, achlorhydria does not subsequently occur, but the secretion of the acid persists throughout the duration of the disease.

#### Clinical Features and Diagnosis.

Whether Hurst's view is correct or not, it is certain that the majority of cancers of the stomach occur in people previously well and often in apparently robust health. In a small proportion a history of antecedent dyspepsia may be obtained, often of many years' duration. It is possible that the latter patients are those in whom cancerous change has occurred in chronic peptic ulcer. However, ulcer of the stomach is not often a cause of cancer and a duodenal ulcer never becomes malignant.

It is probable that the view according to which cancer was regarded as a common sequel of gastric ulcer, was based on a misinterpretation of the histology of excised ulcers. Certainly clinical experience is adverse to the view that more than a very small proportion of cancers are preceded or caused by ulcer.

The most usual history obtained from a patient is that of indigestion and anorexia, which has begun insidiously a few weeks or months previously, and has been accompanied by loss of weight and lassitude. A history of this kind should at once arouse the suspicion of cancer and the onus of proof is to show that the cause of the symptoms is not malignant disease.

Slight as the chance of a cure may be, even with early diagnosis it is our duty to endeavour at once to discover the cause of every case of dyspepsia occurring in a previously healthy middle aged person. Very often the patient fears cancer himself, even if he does not say so, and for the sake of his peace of mind one should ascertain the true nature of the condition which may upon investigation prove to be one of gall bladder disease or some other condition associated with dyspepsia.

Other cases occur in which the earliest manifestations are not those described above.

The symptomatology depends largely on the site and nature of the growth. Growths near the orifices of the stomach cause obstruction. Those of the body and fundus usually give rise to anaemia and weakness, while infiltrating growths may cause severe pain by their penetration of neighbouring organs. In other cases when the body of the stomach is first involved, this silent area may give rise to no direct gastric symptoms or signs.

With a consideration of these facts, by a careful inquiry into the nature of the symptoms and a searching physical examination it is often possible to make a diagnosis before the condition becomes self evident, while the clinical investigation can

<sup>1</sup> Read at a meeting of the South Australian Branch of the British Medical Association on February 27, 1930.

be assisted by the laboratory and radiographic methods to be discussed in the subsequent papers.

Important early symptoms which cause the patient to seek advice are pain, anorexia, asthenia and wasting, obstructive symptoms and pallor.

#### Pain.

At first pain is seldom very severe, because the growth has not yet penetrated beyond the wall of the stomach. The pain is usually epigastric, but it may be felt behind the lower end of the sternum. It is generally described as gnawing. It is not relieved by food, but as a rule immediately aggravated by it. It is, however, not infrequently improved by a milk and cereal diet with alkaline powders. This may deceive the physician, causing him to believe that the condition is gastric ulcer. In some cases there is no pain whatever, only a vague sense of discomfort and even the latter may be absent. Occasionally pain in the back at the level of the ninth and tenth dorsal spines and due to infiltration of the pancreas is the earliest symptom.

#### *Loss of Appetite, Strength and Weight.*

Several patients have consulted me on account of loss of appetite, strength and weight and only by very careful questioning have I obtained any evidence of digestive disturbance. These three symptoms, occurring together in an elderly man, are of very grave significance, since they are nearly always due to malignant disease. They may occur some time before the growth causes anaemia and the patient's appearance may not be cachectic. Indeed in an old man, sent to me by Dr. Halloran, the haemoglobin was actually above 100%.

#### *Obstructive Symptoms.*

Cancer is the commonest cause of pyloric obstruction. Its presence should always be suspected when symptoms of pyloric obstruction occur in a person who has not suffered from duodenal or prepyloric ulcer, even if the age of the patient seems against such a diagnosis. Within a year I have seen two such patients, both men under thirty, one of them a medical man. In both there were dilatation of the stomach and retention of food and its subsequent vomiting after many hours.

Cancer near the cardiac orifice early causes partial or nearly complete obstruction. In such circumstances the food and sometimes even water are regurgitated almost immediately after being swallowed and quite unchanged. This may be an inaugural symptom. Such cases must be distinguished from cancer of the oesophagus and also from achalasia of the cardia, but a little consideration enables one to do this.

Cancer does not begin at the lower end of the gullet. When the cardiac orifice is obstructed, it is always from its gastric aspect. The patient can generally locate the site of the obstruction by pointing to the substernal notch.

Cancer of the body sometimes causes hour glass contraction which may give rise to obstructive vomiting, but the stomach holds less than in pyloric obstruction and the vomiting is not so immediate as in cardiac obstruction. Hour glass stomach, due to simple ulcer, occurs almost exclusively in women. I have seen a patient in whom cancer supervened on an hour glass stomach, due to a simple ulcer.

#### *Hæmorrhage.*

When vomiting occurs, the vomitus may contain blood which is brown and stringy, mixed usually with mucus. Bleeding is seldom copious and severe hæmatemesis is rare.

Any of these symptoms may occur before a tumour can be felt. Only one-third of the surface of the stomach is accessible to palpation and quite a large cancer may elude detection when it is sheltering behind the ribs. Sometimes it is possible to feel a cancer of the body or of the greater curvature by asking the patient to stand, to lean forward and to support himself by his hands on a table. The examiner stands behind him, with his left palm on the patient's ribs and his fingers curled over the left costal margin. The growth may be felt at the end of inspiration, pushing down against the fingers. Growths of the pyloric end are usually palpable, but sometimes abdominal distension or the general build of the patient, in the presence of small scirrhouous growths, renders them inaccessible to palpation. Dilatation of the stomach is as a rule easily revealed by Seidlitz powders given separately.

#### *Anæmia.*

Increasing pallor and weakness, without other prominent symptoms, may be caused by a large, soft, ulcerating growth of the fundal end of the stomach. I have seen several such patients in whom the bedside diagnosis was very difficult. There may be no pain, no vomiting and no tumour; but the anæmia is secondary and the stools persistently contain occult blood.

#### *Metastases.*

Not infrequently the symptoms which first attract the patient's attention, are actually due to secondary deposits.

I well remember a woman of thirty-five, who was treated many years ago in the Adelaide Hospital. She complained of persistent pain and rigidity of the dorsal part of the spine. After she had been treated for six months for Pott's disease, a growth for the first time could be felt in the stomach.

A patient may seek advice for painless distension of the abdomen. Examination may reveal massive enlargement of the liver which may be of normal outline and quite smooth. I have seen several patients in whom a soft growth, no larger than a florin and which has given rise to no gastric symptoms, has been the source of carcinomatous homogeneous infiltration of the liver which at autopsy has weighed many pounds.

Bearing in mind the fact that a growth in the stomach may cause only indefinite symptoms, even

after it has widely disseminated, we should carefully search for evidence of secondary deposits and conversely in every patient in whom evidence of glandular or visceral malignant dissemination appears, the stomach should be carefully examined as a possible site of the primary lesion. Rectal or vaginal examination may reveal malignant masses in the pelvis which occur early and commonly in many cases of gastric cancer. A solitary hard gland, just above the clavicle, behind the left sternomastoid muscle, may be the first physical sign (Virchow's gland). Gastric cancer should always be borne in mind in the diagnosis of the cause of jaundice or ascites.

#### *Disturbance of Bowel Function.*

Disturbance of bowel function is usually in the form of constipation; but intractable diarrhoea, together with progressive loss of weight, were early symptoms in a patient suffering from gizzard cancer—an even, tough infiltration of the gastric walls leading to general shrinking of the organ without obstruction.

This rare type of scirrhous carcinoma which is one cause of "leather bottle" stomach, may give rise to a firm oval tumour moving down below the ribs on inspiration. I have seen it mistaken for a mobile kidney in one patient and for enlargement of the spleen in another.

In these rather fragmentary notes I have purposely omitted an account of the uses of special tests. It is to be understood that when the diagnosis is in doubt, every case should be thoroughly investigated by all known methods. Preliminary tests which may afford useful information, are examination of vomited material for free hydrochloric acid with dimethylamidoazobenzol, especially if retention of food has occurred, and the examination of the faeces for occult blood. The known, although rare, occurrence of gastric syphilis makes the Wassermann test necessary in some doubtful cases.

#### LOCAL VENESECTION IN THE TREATMENT OF SNAKEBITE OF THE LIMBS.

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THE experiments of Fairley<sup>(1)</sup> (1929) on sheep and goats have demonstrated the ineffectiveness of ligature alone in combating the effects of the injection into a limb of even a single certainly lethal dose of the venoms of Australian elapine snakes (death adder, copper-head and tiger snake) and have focused attention on the extremely short "absorption time" of these venoms. Immediate ligature is obviously of great value in localizing the venom to the ligated part until such time as antivenine can be injected intravenously to neutralize the venom when this is admitted to the general circulation by the removal of the ligature.

The following is a method of treatment which I recently applied in a case of the bite of a death adder and the value of which I hope later to verify experimentally. In the meanwhile, since antivenine is not yet available, the method is worthy of trial in cases of snakebite of the limbs. Let us assume that the patient has been bitten on the index finger of the left hand. The treatment is as follows:

1. A ligature (A) is applied round the base of the index finger and a second ligature (B) round the arm, 7·5 or 10·0 centimetres (three or four inches) above the elbow joint. These ligatures must be tight enough to obstruct completely the arterial circulation. (See accompanying figure.)

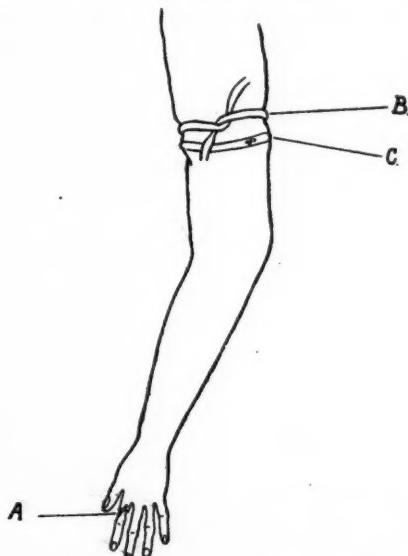


Diagram showing application of ligatures.

2. Incisions about six millimetres (a quarter of an inch) deep are made in the line of the fang punctures after the surface of the bitten part has been washed to remove any venom on the surface of the skin. Alternatively each puncture may be excised by a V-shaped incision.

3. The blood in the finger is milked out by massage from above downwards through these wounds.

4. A narrow bandage (C) is placed round the arm immediately below the upper ligature, tight enough to obstruct completely the venous return, but not tight enough to obstruct the arterial flow.

5. A firm bandage is applied downwards from C and the blood in the forearm is squeezed down towards the periphery (the fingers, except the index and the thumb, are also compressed by this bandage). The lower ligature (A) is then taken off and the blood is squeezed downwards through the index finger and flows out through the wounds at the site of the bite.

6. The ligature A is reapplied and process 5 is repeated, after some arterial blood has been allowed

to flow into the bite by lifting ligature B for thirty seconds and reapplying it. By these procedures, carried out rapidly during the first few minutes after the bite, some of the venom may be washed out from the site of the bite.

7. The ligature B is again lifted for thirty seconds and firmly reapplied. Blood is thus allowed to flow into the forearm, but there is no outflow owing to obstruction of the venous return by the bandage C.

8. One of the superficial veins of the forearm is now opened by a clean cut with a sharp scalpel and the forearm is emptied of blood by bandaging from below upwards to the site of the venesection.

9. This process (7 and 8) is repeated a number of times. An interval should be allowed between the entry of the arterial blood to the forearm and the removal of the venous envenomated blood by bandaging from below upwards—to permit of the establishment of equilibrium between the blood and the venom containing tissues. The total amount of blood removed must, of course, depend on the age and size of the patient. A heavy man could with advantage be bled in this way to the extent of a pint and a half, whereas a young child could only safely be bled a few ounces. An interval of some minutes may with advantage be left between each repetition of the procedure. The procedure of local venesection is obviously of value only if the ligature has been applied immediately after the bite and has not been lifted till seen by a medical man.

If a suitable donor is available and the patient has reached hospital, say, one hour after the bite without the ligature being lifted, local venesection may be repeated many times and a much larger quantity of blood removed, this being replaced by transfusion into the other arm.

In the case of a child this last procedure would obviously be of value. The ligature could safely be left on for several hours with the occasional entry into the limb of fresh blood and its removal through the venesection wound. The advantage of repeated small bleedings over a single large one is obvious. Care must be taken to avoid the addition of the effects of haemorrhage to the cardio-vascular collapse which is so striking a feature of the action of these venoms.

#### Reference.

<sup>(1)</sup> N. H. Fairley: "Criteria for Determining the Efficacy of Ligature in Snakebite," THE MEDICAL JOURNAL OF AUSTRALIA, March 23, 1929, page 377.

### Reports of Cases.

#### FIVE CASES OF GASTRIC ULCER.

By F. CH. DE CRESPIGNY, M.B., B.S. (Melbourne),  
F.C.S.A.,

Honorary Surgeon, Ararat Hospital.

In discussing the following cases of gastric ulceration selected from among a number of case histories and describing the results of operative treatment, I do not

suggest that there is anything particularly unusual in the cases themselves or in the treatment applied. Each, however, presents certain points of interest and taken together they emphasize the protean nature of the symptom complex of this very common and interesting condition. My experience in the surgical treatment of ulcer of the stomach is far from being extensive, but it has been sufficient to impress me with the impossibility of being certain that a gastric ulcer has healed as a result of purely medical treatment, without careful periodical observation by radiological means, so that the ulcer crater can actually be seen to heal and the affected part of the stomach return to normal. Even after such methods of observation, subsequent events sometimes raise a very definite doubt as to whether an apparently healed ulcer has ever really completely healed.

#### Case I.

Mr. N.A.H., aged forty-seven years, a farmer, was seen first on December 8, 1922. For the last three years he had suffered from recurring pains in the epigastrium; he generally vomited during attacks and the pain was relieved thereby. There had never been any visible blood in the vomitus and there had not been any constant relationship between the taking of food and the occurrence of the pain. There had been no loss of weight and no visible melena.

Examination revealed definite pyorrhea. Tenderness was present on pressure in the mid-epigastrium and definite tenderness was elicited over McBurney's point. With a barium meal no filling defect was seen in the stomach, but there was a spasm of contraction constantly present on the greater curvature in the pyloric region of the stomach. The tenderness over the appendix was confirmed, but the appendix was not seen. A provisional diagnosis of chronic appendicitis and possibly gastric ulcer was made. The patient refused operation and was put on alkaline and dietetic treatment. The teeth were extracted and the pyorrhea was treated.

On April 22, 1923, in spite of careful treatment, in which the patient had fully cooperated, there had been only spasmodic improvement. He desired an operation.

At operation a small ulcer was found on the lesser curvature 2·5 centimetres (one inch) from the pylorus, with practically no surrounding cicatrization or thickening. The stomach was opened and the index finger easily passed through the pyloric sphincter. The ulcer was very shallow and apparently involved only the mucous membrane and the *muscularis mucosæ*. The stomach was closed. The appendix was found thickened and adherent and was removed.

On May 31, 1926, it was noted that he had had recurrence of old pain and that tenderness was present on pressure in the mid-epigastrium. He was put back on intensive alkaline and dietetic treatment which had been allowed to lapse one year after operation.

On June 20, 1926, it was noted that he had been free of pain since May 31, 1926.

On August 24, 1927, he complained that he had lately begun to have pain before meals, the pain was relieved by food. Tenderness on pressure was present in the mid-epigastrium. He was put back on to alkaline treatment which he had been neglecting lately. Tincture of belladonna was given before meals.

On April 1, 1929, he had been well since. He had been careful about his diet, but had not taken any alkali for the last four months.

#### Comment.

This was a case of subacute gastric ulcer and it was considered that the better course was to eliminate the septic foci in the teeth and appendix and to treat the ulcer by medical means. In the light of the subsequent history which strongly suggests a breaking down of the ulcer on at least two occasions, one would say that the correct treatment would have been the excision of the ulcerated portion of the stomach.

#### Case II.

Miss A.J., aged forty-six years, domestic duties, was seen on June 21, 1927. She complained that practically all her life she had suffered from recurring abdominal pain after food and attacks of diarrhoea alternating with

constipation. She could not remember ever having been quite free from this pain. She indicated the epigastrum as the location of the pain. She had suffered from exophthalmic goitre two years previously and this had been treated in New Zealand by partial thyroideectomy.

On examination she looked emaciated. She had periodical attacks of copious vomiting during which she sometimes vomited food eaten at the previous two or three meals. Just before operation on her thyroid she had had one supposed haematemesis followed by a tarry stool. Apart from this there had been no visible blood in her vomitus. The pain became accentuated about fifteen minutes after food, but it never went completely away and interfered greatly with her sleep at night. Her weight was constant. A thyroideectomy scar was present in the neck. Some exophthalmos was present. There was a slight lag in the upper lids when the eyeballs were moved downwards. The power of convergence was decreased. The pupils were equal and reacted to light. The optic discs were normal. Some dental caries was present. The knee jerks were accentuated. The pulse rate varied from 100 to 120 in the minute. The heart and lungs were normal. The abdomen was protuberant and definite stomach splash could be elicited. Pronounced tenderness was present in the mid-epigastrum at a point which could be covered by a finger tip.

Owing to a definite predisposition to vomiting it was impossible to pass a fine stomach tube in order to do a fractional test meal, but a specimen of vomitus was examined from a specimen vomited early in the morning. This was bile stained, contained no blood, the free hydrochloric acid expressed as the number of cubic centimetres of decinormal sodium hydroxide required to neutralize one hundred cubic centimetres of gastric contents, was 25.

A barium meal given on June 23, 1927, revealed an hour glass deformity in the pyloric portion of the stomach with a large twenty-four hour residue in the proximal portion. Owing to the unsatisfactory condition of the patient for a major operation, it was decided to postpone operation as long as possible. She was put on alkalis with belladonna before meals and her teeth were extracted.

In spite of temporary improvement, the patient, on September 24, 1927, was as bad as ever. Operation was advised. On exposure of the stomach an old healed ulcer was found five centimetres (two inches) proximal to the pylorus, causing a definite hour glass constriction of the lumen. The communicating passage between the two portions of the stomach would admit only the tip of the little finger. Several enlarged lymphatic glands were present in the gastro-hepatic omentum. The gall bladder was normal. The stomach was divided transversely on the distal and proximal sides of the constriction and the constricted portion was completely removed. The divided ends of the stomach were then sutured and the continuity of the organ restored. She was discharged from hospital in six weeks after a normal convalescence with the exception of a fairly stormy first three days.

On January 11, 1929, she felt very well. No gastric discomfort was present. Exophthalmos and eye signs of hyperthyroidism had cleared up. She had gained 12·6 kilograms (two stone) in weight.

On August 10, 1929, she was very well. She said she could not remember ever having felt so well.

#### *Comment.*

This case was extremely interesting in that there was a definite hyperthyroidism associated with the stomach condition. From her history I was convinced that the gastric condition antedated the former by years and I can only surmise, and it seems a reasonable supposition, that the goitre might not have required surgical treatment had the other condition been diagnosed and treated years before.

#### *Case III.*

Mr. T.A., aged thirty years, an asylum attendant, was first seen on November 27, 1928. This man had had constant pain in the epigastrum for the last three weeks. He was given a barium meal and immediately examined by the fluoroscope. The stomach appeared normal in outline as far as the pylorus, but there was no passage of

barium through the pyloric sphincter during the screening. He was told to report again in six hours, but returned in three, saying that the pain was more severe. He was sent to hospital, but fell in the street just outside the surgery gate in acute pain typical of perforated gastric ulcer. He was sent to hospital and was operated on. An ulcer was found surrounded by much scar tissue with a pinhole perforation in the centre. There was a fair amount of milky fluid in the peritoneum. The perforation was closed and the peritoneal cavity drained. On December 18, 1928, he was discharged from hospital on alkalis and ulcer diet.

On February 13, 1929, he had had some return of pain. He had been drinking heavily; he had always been a fairly heavy drinker.

On February 27, 1929, in spite of treatment, the epigastric pain, increased by food, but never completely leaving him, was still present. The barium meal revealed a small ulcer crater in the same position as that of the previous ulcer. Partial gastrectomy was advised.

At operation the pyloric portion of the stomach was removed. The pylorus was closed and the stomach anastomosed with the Jejunum by end-to-side anastomosis through the transverse mesocolon. The abdomen was closed without drainage. Convalescence was uneventful except for some breaking down of the wound.

On January 1, 1930, the patient had been perfectly well since operation in spite of fairly constant drinking. He had had no return of ulcer symptoms. There was no trace of the slightest discomfort after meals.

#### *Comment.*

The constant pain increased after an interval following food, but never completely leaving him, was a very striking feature. This pain appears to be very typical of the "perforating type" of ulcer which goes on to perforation in spite of medical treatment and often in spite of surgical treatment which does not involve the removal of the ulcer-bearing area of the stomach.

#### *Case IV.*

Mrs. S.F., aged sixty years, was first seen on December 21, 1928. She had had pain immediately following food for three months. Pain lasted for about one and a half hours. She vomited occasionally, but had not noticed any blood in the vomitus or tarry stools. Bicarbonate of soda did not relieve pain. She had had similar pain twenty years before, when she was told she had a gastric ulcer. She had lost weight lately.

Examination revealed a thin, somewhat emaciated looking woman with a sallow complexion. Tenderness was present on palpation under the left costal margin where a mass could be felt. A barium meal revealed an hour glass constriction in the mid-gastric area with a crater on the posterior wall of the stomach adherent to the pancreas. It was not considered worth while making a fractional test meal examination, because on making an attempt vomiting occurred and the patient became very exhausted.

At operation a mass was found involving the mid-gastric region extending towards the cardia and firmly fixed to the pancreas. It felt like a neoplasm, but in the absence of any obvious metastases it was decided to do a partial gastrectomy. The stomach was divided 3·75 centimetres (one and a half inches) distal to the mass. The proximal portion was raised and freed from the pancreas, some pancreatic tissue being removed with the mass. The stomach was divided 2·5 centimetres (one inch) proximal to the mass and the affected portion completely removed. It was then found that the two portions of the stomach could be easily brought together. They were anastomosed and the continuity of the stomach restored. The raw area on the pancreas was covered with peritoneum. The abdomen was closed without drainage.

On examination of the specimen it was found to be a penetrating ulcer just below the lesser curvature, eating into the pancreas and surrounded by a mass of firm fibrotic tissue. The pathologist reported intense superficial inflammation with deep fibrosis, but no sign of malignant disease.

On December 1, 1929, she was quite well, had gained weight, had no indigestion, but was taking an "ulcer diet."

*Comment.*

Although this ulcer had obviously been present for a considerable time, the patient persisted that her pain had started only three months before. This probably coincided with the onset of the "intense superficial inflammation" mentioned in the pathologist's report.

**Case V.**

Mr. C. McC., aged fifty-eight years, a farmer, was seen on April 20, 1929. This man was brought to me suffering from perforated gastric ulcer. Six years previously I operated on him for the same condition. At operation a perforated ulcer was found five centimetres (two inches) from the pylorus in apparently the same position as at the prior operation. He was suffering greatly from shock so the perforation was invaginated, the peritoneum cleaned of gastric contents with a suction pump and the abdominal cavity drained. Convalescence was uneventful.

On March 1, 1930, the patient had been very well since the operation, but in view of his past history I have strongly advised him to have a partial gastrectomy operation performed.

*Comment.*

The striking feature of this case was the fact that both perforations followed mild discomfort after meals, which was never actual pain, and in each instance was present only for about three weeks prior to the perforation occurring.

**Summary.**

1. Five cases of gastric ulcer are described.
2. The very varied symptom syndrome of complicated gastric ulcer is emphasized.
3. In two of the cases the continuity of the gastric lumen was restored after partial gastrectomy and without a short circuiting operation, with gratifying results.

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**CARCINOMA OF THE STOMACH WITH APPARENT CURE.<sup>1</sup>**

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By E. BRITTEN JONES, M.R.C.P. (London),

AND

MALCOLM SCOTT, M.S. (Adelaide), F.R.C.S. (England).

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THE following case is of interest on account of the almost complete absence of clinical signs and symptoms, the early diagnosis being established by the patient vomiting up a piece of carcinomatous growth.

The patient was a man, aged twenty-four years. He was first seen by one of us (E.B.J.) on December 21, 1925; he complained that he had been off colour and had felt tired for one week. There was no history of pain or dyspepsia. In the course of taking a routine history it was learned that his motions had been dark for the few days prior to his being seen.

Examination revealed a pale cachectic man with a slightly furred tongue. Abdominal examination disclosed no rigidity, no mass, no tenderness. Blood was present in the faeces.

He was put to bed for observation and on December 27 he vomited on two occasions and in the vomitus a fleshy mass the size and shape of a small walnut was present. This led to the patient being examined by X rays on December 29, when a large filling defect of the pyloric antrum and of the greater curvature was observed.

On December 30 he was operated on by one of us (M.S.). The pyloric half of the stomach was removed, the duodenum closed and the jejunum anastomosed to the cut end of the stomach.

We are indebted to Dr. Lionel Bull for the following pathological report:

Sections of the portion vomited show a spheroidal cell carcinoma. There is slight necrosis of the surface in one part and in another the surface is covered by mucous membrane which is almost completely invaded by the tumour cells. The tumour cell is undifferentiated, shows little cytoplasm and there are numerous mitotic figures present. There is no evidence of necrosis and the cells are very well preserved. The stroma is scanty and consists of young fibrous tissue. The tumour itself is a fungating mass, roughly spherical, with a diameter of about eight centimetres. An examination of the base of the tumour fails to indicate a tendency to invade the muscle wall of the stomach.

Sections of the tumour mass show solid accumulation of the same undifferentiated spheroidal cells. There is no tubule formation. There is a scanty stroma of young fibrous tissue. There are numerous mitotic figures in the tumour cells and the whole picture suggests a very rapidly growing neoplasm. In spite of this the tumour does not appear to be particularly well supplied with blood vessels.

Deposits could not be found in any of the lymphatic glands.

The tumour is a carcinoma simplex, the tumour cells tending to occur in large solid masses and not to infiltrate the lymphatic spaces.

Since his operation the patient has remained well. Clinical examinations with occasional X ray investigation have failed to disclose any recurrence. The period since operation, four years and two months, coupled with the rapidly growing nature of the original tumour, makes it probable that the patient may be regarded as cured.

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**A FATAL TICK BITE.**

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By C. W. SINCLAIR, M.B., Ch.M. (Sydney),  
Longueville, New South Wales.

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THE patient was a delicate girl of three and a half years, who was subject to attacks of bronchial asthma. She was bitten by a tick. The time when the tick attached itself is uncertain, but it was probably on November 16, 1929, as the child was in the bush on that day and suffered from indefinite irritability and malaise from then on. She lived in a house surrounded by bush and ticks are almost certainly present in the garden, so she may have picked it up at any time. On November 19, it was noticed that her pupils were dilated and her eyes staring. On the morning of November 20, her gait was slightly unsteady. The tick was found at midday by her mother and broken off just behind the neck in an attempt at removal. She was then brought to me and I was able to recover the remainder. It was situated in the scalp over the left parietal bone and there was considerable swelling around it, but this subsided in a few hours after its removal. At that time the child was crying lustily and could walk across the room although she was slightly unsteady. Her reflexes were normal, her pupils about two-thirds dilated and reacted very sluggishly to light. At 10 p.m. she could not stand. She could sit up and move her arms actively. Next morning her legs were completely paralysed; she could not sit up; she could move her head from side to side, but could not raise it. Reflexes in the legs and abdomen were absent. There was paralysis of the *sphincter ani*. During the day she developed paralysis of deglutition. Late that evening she seemed slightly better, but died suddenly of heart failure at 4 a.m. on November 22. Her temperature was subnormal to normal until 2 p.m. on November 21, when it was 37.2° C. (99° F.) and it rose to 38.9° C. (102° F.) before death. Her pulse was strong and normal in rate until a few hours before she died, when it became rapid and feeble.

<sup>1</sup> Read at a meeting of the South Australian Branch of the British Medical Association on February 27, 1930.

## Reviews.

## AN HÆMATOLOGICAL ATLAS.

"CLINICAL ATLAS OF BLOOD DISEASES," by Dr. A. Piney and Dr. Stanley Wyard, is a very welcome addition to the hæmatological library.<sup>1</sup> It is especially welcome because it offers something novel and something new. In less than one hundred pages the authors have condensed information to supply the student with an up-to-date and complete survey of all hæmatological work and to give to the hæmatologist a working standard which should at last result in uniformity of ideas as regards cytological classification and nomenclature. Every blood cell is beautifully illustrated and accurately described. There are thirty-six coloured plates, excellently done, producing perfect illustrations of microscopical pictures seen in all pathological blood conditions.

In addition there are short but accurate descriptions of every blood disease met with in clinical medicine. Symptoms, aetiology, diagnosis, pathology, pathogenesis, prognosis and treatment, in addition to the blood picture are briefly outlined in each instance. We have no hesitation in highly recommending this work to all students, clinicians and hæmatologists.

## RADIUM THERAPY.

THE difficulty of writing a text book on radium therapy is revealed in Mr. Souttar's recent publication, "Radium and Its Surgical Applications."<sup>2</sup> The subject is in such a fluid state that no author can hope to present a book which will remain up to date a year after its appearance. To provide an adequate sketch of the physics of the subject and to supply the detailed technique of certain approved methods within sixty pages is a task which surely only a surgeon would undertake.

Perhaps the greatest difficulty facing the practitioner is in the proper evaluation of a new method of treatment. The neophyte burning with a fresh enthusiasm is not likely to show a nice discrimination in the selection of the cases in which the method should be applied. Few in these days will contest the therapeutic value of radium in cancer of the skin, however wide the differences may be as to indications and technique. Nor is its place doubted in the treatment of cervical cancer, though here again its place is yet defined. And in cancer of the tongue, for the treatment of primary lesions in selected cases, it will be admitted that radium treatment is less unsatisfactory than surgical excision.

But once we leave this sure ground, all else is uncertain. The work in cancer of the rectum is interesting, but it has not yet reached a stage justifying radium therapy, except as a poor substitute for surgery. A lack of balance is therefore shown in Mr. Souttar's book when he gives some three pages to the treatment of cancer of the uterus and some four to that of cancer of the breast, in which the field is limited and the method not yet proven. Again, more space is given to the treatment of cancer of the oesophagus than to that of the skin. Yet the results from the intracœsophageal introduction of radium have been very disappointing and Sluys has recently declared for external irradiation. The techniques given are those which are currently approved in the leading clinics, and the book thus provides the reader who has not read the descriptions in recent journals, with a rapid *coup d'œil* over some of the methods of radium therapy. The danger exists that such a publication may appear as a complete and sufficient aid to the surgeon who is ambitious, to add

the new instrument to his armamentarium. It cannot be too strongly emphasized that radium therapy is a precise and scientific method of treatment and that success can be built up only on a sound basis of the knowledge of physics and a conscientious apprenticeship in practice. There has succeeded to the recent prejudice against irradiation an equally foolish enthusiasm on the part of those who are least qualified to practise it. The amount of haphazard and ineffective work in radium therapy that is being done at present, constitutes a menace to the public at large and will in the end surely react harmfully against the method. Mr. Souttar's book is a correct account of the physics of the subject and of certain techniques, but no surgeon would be justified in embarking on the perilous seas of radium therapy equipped merely with the knowledge supplied by even a more complete book. It would be no less foolish than for a surgical tiro to begin his operative surgery with a *vade-mecum* written by a physicist.

## AN INTRODUCTION TO PHYSIOLOGY.

IN editing and revising the sixth edition of Bainbridge and Menzies' "Essentials of Physiology" Professor Hartridge has produced what is practically a new book.<sup>1</sup> The arrangement is very different from that of the earlier editions and there is a great deal of new matter. An excellent arrangement is the profuse division into paragraphs headed by heavy type. The book covers a remarkably wide range, but as there are under five hundred pages of smaller size than is usually seen in text books and there are numerous diagrams, the treatment is rather scanty; a beginner would thus frequently have difficulty in properly grasping essential details. Within the limits set the subject is dealt with in a concise and clear manner. Many of the diagrams are new and those illustrating the sections on the central nervous system are particularly interesting.

The book shows some evidence of haste in composition in some parts. Thus in several places certain statements have been made in one part of the book and quite different statements on the same subject in another. Thus on page 395: "Recent evidence shows that the ammonium salts are formed by the kidney cells out of part of the urea brought to them by the blood from the liver"; while on page 459: "The ammonia normally found in the urine represents the small amount which escapes conversion into urea by the liver."

The sections on biochemistry are on the whole not so well done as those on general physiology. In spite of these criticisms the book is a very fine if rather concentrated introduction to physiology and can be thoroughly recommended to students and others.

## ANKYLOSTOMIASIS.

THAT a book on hookworm disease should extend to 477 pages will come as a surprise to most medical men who have been taught to regard that disease as easily diagnosed and easily cured and its prevention and control as one of the simplest of the problems of preventive medicine. Yet such is the space required by Professor Asa C. Chandler of the University of Texas to give "an adequate summary of the important work which has been done in recent years" on this disease and to "give up-to-date information about the various phases of hookworm disease as a basis for further investigation on the subject or for an intelligent understanding of the situation as it exists at present."<sup>2</sup>

<sup>1</sup> "Bainbridge and Menzies' Essentials of Physiology," Edited and Revised by H. Hartridge, M.A., M.D., Sc.D., F.R.S.; Sixth Edition; 1929. London: Longmans, Green and Company. Demy 8vo., pp. 537, with illustrations.

<sup>2</sup> "Hookworm Disease: Its Distribution, Biology, Epidemiology, Pathology, Diagnosis, Treatment and Control," by A. C. Chandler, M.Sc., Ph.D.; 1929. London: Macmillan and Company, Limited. Royal 8vo., pp. 500, with illustrations. Price: 21s. net.

<sup>1</sup> "Clinical Atlas of Blood Diseases," by A. Piney, M.D., M.R.C.P., and Stanley Wyard, M.D., M.R.C.P.; 1930. London: J. & A. Churchill. Post 8vo., pp. 99, with illustrations. Price: 12s. 6d. net.

<sup>2</sup> "Radium and its Surgical Applications," by H. S. Souttar, D.M., M.Ch. (Oxon), F.R.C.S. (England); 1929. Royal 8vo., pp. 67, with illustrations. Price: 4s. 6d. net.

It is difficult to point out where condensation could effectively have been practised in a work which is intended to be a book of reference as much as a text book.

The general plan of the work is to be commended and permits a reader to find easily where any particular aspect of the subject is dealt with.

Of the ten chapters of the book those on geographical distribution and epidemiology will be of most general interest. Though the author's experience has been acquired in America and India, he has made himself fully acquainted with the position in other lands. We note that the position in Australia is well set out, though we should have preferred to have seen the patchiness of the distribution of the disease in our "hookworm belt" more clearly emphasized. Under the heading of "Epidemiology" the influence of environmental factors such as rainfall, humidity, temperature, soil and drainage upon the incidence of the disease as well as the better known human factors is appropriately set out. Methods of diagnosis are very fully discussed and then briefly summarized. In the author's opinion the "simple smear" is adequate for the ordinary practitioner, the Willis method is "eminently fitted for mass diagnosis in hookworm campaigns, but for greatest precision in diagnosis in central laboratories the direct centrifugal flotation method (of Lane) stands out in a class by itself."

In the discussion on treatment thymol is rightly condemned as dangerous and inefficient,  $\beta$ -naphthol is declared to be unreliable in its results, and oil of chenopodium and carbon tetrachloride are approved as suitable drugs. Though it is said that "carbon tetrachloride outscores chenopodium in about the same degree that chenopodium outscores thymol," the author recommends the use of both drugs in treating each patient.

Anatomy of the adult worms, their life cycle and mode of infection and the pathology of hookworm disease are fully described in three chapters with which no serious fault can be found. The concluding chapter of the book dealing with prevention will be read with benefit by all interested in public health work.

Altogether Dr. Chandler has presented his subject very well and his book will be of great value to medical men in tropical countries and should find a place on the library shelves of every up-to-date public health authority.

#### PROGRESS IN PREVENTIVE MEDICINE.

IN "Recent Advances in Preventive Medicine," Dr. J. F. C. Haslam, taking full advantage of his opportunities as Director of the Library Services of the London School of Hygiene and Tropical Medicine, makes a valuable and comprehensive review of the more interesting and important recent contributions to the theory and practice of hygiene.<sup>1</sup> This hand book is an excellent supplement to the well-known "Outline of the Practice of Preventive Medicine" by Sir George Newman.

Under "eugenics" the interesting observation is recorded that "most of the insane are born of parents who are not themselves insane," a fact which must give pause to those who look for any rapid elimination of mental disease by a programme of sterilization or segregation of the mentally afflicted. The Californian experience, however, suggests that no serious harm need be anticipated from a well safeguarded and carefully administered policy of eugenic sterilization.

The chapter on maternal mortality is especially interesting as to the midwifery service of Denmark, with a maternal mortality during or just after delivery of 2·04% and from puerperal fever of 0·9%.

<sup>1</sup> "Recent Advances in Preventive Medicine," by J. F. C. Haslam, M.C., M.D. (Edinburgh), M.R.C.P. (Edinburgh), D.P.H., with a chapter on the Vitamins by S. J. Cowell, M.A., M.B., M.R.C.P.; 1930. London: J. and A. Churchill. Post 8vo., pp. 328. Price: 12s. 6d. net.

In Holland the training of a midwife takes three years, thirty graduating annually in a population of eight millions. Midwives whose average income is £280 with 100 cases per annum conduct 60% of the confinements in Holland. "Municipal midwives are supervised by public health doctors."

With regard to infant mortality, even in New Zealand and Holland, with their low general rates, that under one month has been little reduced. The Dutch rates appear more favourable than they really are, because children born alive, but dying within three days, are recorded among the still-births and not among the infant deaths.

The school medical officer will be interested in the chapter entitled "Wastage of Young Life, the Pre-School Child and Nutrition," but especially with the remarkable photographs showing the generally improved appearance of children in 1924 contrasted with similar school groups in 1894.

Milk and recent advances in the knowledge of vitamins are well reviewed.

The chapters on atmospheric conditions and hygiene in industry give much recent knowledge on these subjects whilst that of immunization against the common cold, diphtheria and scarlet fever, record most recent work on the subject.

This work should be read by everyone who desires to keep up to date with public health knowledge. It will be invaluable to the student of public health and an inspiration to those who are engaged in research.

#### MEDICAL ESSAYS.

It is a treat to come across a book by an American author, the language of which reminds us that, even if there be Maurice Fishbeins today, there have at all events in the past been medical writers in the United States of America such as Oliver Wendell Holmes and William Osler.<sup>1</sup>

We doubt, however, whether our faint belated protest will have any effect in staying the American reformation of Greek spelling. *Olδημα*, for example, can by no Christian method be converted into edema; if the Greeks intended it to be spelt with an "e" they possessed at least a long and a short vowel for the purpose; not that we are defending the British rendering, "œdema," as against "oidema." Might not the American iconoclast as reasonably write "œmrology" and omit the phonetically superfluous "e"?

Another point that is noticeable in the addresses is considerable overlapping. Dr. Shelton Horsley must have felt certain that the elect of Brooklyn would not have read in November the address he had already delivered to the heathen of Minneapolis in June of the same year.

Apart from these minor defects and a few trifling typographical errors, it may be stated at once that the addresses are of a high order and could be composed only by a man with sound ideals generally. Experience has taught Dr. Horsley that it is not sufficient for the operator of today to be merely a skilful anatomical "cheirurgeon"; he must be properly equipped with physiological and pathological knowledge and understand how to apply such knowledge; he must be a surgical philosopher in the true sense of the word. Most of the addresses are purely for the benefit of the medical profession; others, such as the one which gives its slightly misleading title to this little book, "Research and Medical Progress," and a brief discussion on the question, "Shall surgeons tell the truth?" might appear in any Saturday evening paper, whilst other articles have a more local, historical colour. But whilst excellent in form and in matter and tone, we fear that these addresses, like so many others that flood our current literature, will prove to be ephemeral.

<sup>1</sup> "Research and Medical Progress and Other Addresses," by J. Shelton Horsley, M.D.; 1929. St. Louis: The C. V. Mosby Company; Melbourne: Stirling and Company. Post 8vo., pp. 208. Price: \$2.00 net.

## The Medical Journal of Australia

SATURDAY, APRIL 26, 1930.

### "Jargon's Dearest Child."

CARDINAL NEWMAN once wrote that: "Thought and speech are inseparable from each other. Matter and expression are parts of one; style is a thinking out into language." Sir Arthur Quiller-Couch, King Edward VII Professor of English Literature in the University of Cambridge, in one of his lectures on the art of writing, said: "You cannot use the briefest, the humblest process of thought, cannot so much as resolve to take your bath hot or cold, or decide what to order for breakfast, without forecasting it to yourself in some form of words. Words are in fine the only currency in which we can exchange thought even with ourselves. Does it not follow, then, that the more accurately we use words the closer definition we shall give to our thoughts? Does it not follow that by drilling ourselves to write perspicuously we train our minds to clarify their thought?" Newman did not intend that his words should apply only to his brethren in Holy Orders, nor Quiller-Couch that his should reach no other ears than those of students of the *literae humaniores*. Clarity of thought is not the perquisite of any one body of men. Unfortunately, so-called scientific men, and medical practitioners among their number, often lapse into the use of slang, of slipshod terms and of jargon which are perhaps convenient for the moment, but which are with difficulty prevented from becoming permanent. It would probably be doing both Newman and Quiller-Couch an injustice to presume that slang terms were unknown to them or that ill-chosen words never passed their lips. Reference to their writings, however, will show that when they put pen to paper, they gave only of their best, they reflected the order of their minds and they did not by suggestion impugn that of their readers.

The art of medical writing has received attention at the hands of such authors as Clifford Allbutt and Dr. Maurice Fishbein. Their books should be

read by all inexperienced medical writers and even the experienced will learn something from them. Dr. F. Guy Griffiths also has rendered signal service to the medical profession of Australia by his articles published in this journal. It is not intended to draw attention so much to the art of medical writing generally as to the misuse of one word, "case," described aptly by Quiller-Couch as "Jargon's dearest child." By many medical writers, or would-be medical writers, case is used indiscriminately to denote the patient, the condition from which he is suffering, and an example of the condition: "The case is admitted," "the case is examined," "the case is operated on," "the case dies," "the patient's case is hopeless," "this man is in similar case," "the treatment of all cases" and so forth. As will be seen shortly, the only permissible use of the word case is in designation of an instance or example: "A similar case of cancer," "in reporting a case of cancer." "The Concise Oxford Dictionary" defines case as "instance of thing's occurring," "actual state of affairs," "position, or circumstances in which one is, plight." As medical definition it gives "person's diseased condition," "instance of disease." It may be questioned whether it is correct to use case in referring to the "person's diseased condition" in view of the fact that neither Gould's nor Dorland's medical dictionary attributes this meaning to the word. The former gives the meaning "a single instance or example of disease" and the latter "a particular instance of disease." Even if it be granted that case may be used for condition, it is never right to use "case" when "patient" is meant. There is another meaning to the word case than that under consideration. The latter comes from the Latin *casus*, fall (*cadere*, to fall); the other meaning is an enclosure of something, a box or bag, coming from the Latin *capsa*, from *capere*, to hold. Quiller-Couch points out that when the word case is used as belonging to someone, as "in the case of John Brown, deceased, the coffin provided was of the usual character," it has a sinister meaning. He explains that John Brown had two coffins, a coffin in a case. It is thus indelicate, to say the least of it, even if it be prophetic, for a medical practitioner to talk of "the case of Mrs. Brown" while the lady is still alive.

As an outcome of this explanation it is suggested that whenever a medical practitioner uses the word case either in speech or in writing, he should pause to consider whether he means the patient or the condition. If he means either of these, he should use them and not "case." It is a useful exercise to endeavour to eliminate the word case altogether. It can be done and the effort will, as Quiller-Couch holds, help the mind to clarify thought. A little care in the use of this and other words will remove the reproach that because speech is slovenly the mind must be the same.

### Current Comment.

#### LIVER TREATMENT OF ANAEMIA.

A GREAT deal has been written in this and other journals on the treatment of anaemia by liver substance or extract. Reports have been concerned mainly with the results as seen in pernicious anaemia. Liver has been given, however, to patients suffering from a variety of other conditions with varying results. As an outcome of the improvement found in pernicious anaemia, hypotheses have been built up to explain the pathogenesis of this disease. In matters of this kind it is useful to take stock of the position at suitable intervals. An opportunity for doing this has arisen owing to the publication of a critical review of the subject from the pen of Janet M. Vaughan, of the Department of Clinical Pathology of University College Hospital.<sup>1</sup> For the purposes of discussion the author has divided the different forms of anaemia into four groups. These will be referred to in turn.

In the first group naturally comes pernicious anaemia. Vaughan has collected records of 630 patients treated with liver. Of 255 of these full details are not available. A successful result was reported in 254 of the 255 and a failure in one. This patient was admitted to hospital in a dying state. The remaining figures are difficult to determine. The total should be 375. They are referred to as 345 in the text and in a table particulars of 395 patients are given. If the latter be taken as the correct number (details of this number are given in the table), it is seen that the average haemoglobin count before treatment was 38%. After treatment sixteen patients had under 3,000,000 erythrocytes per cubic millimetre with an average haemoglobin value of 44%, 54 had over 3,000,000 erythrocytes with an average haemoglobin value of 72% and 325 had over 4,000,000 erythrocytes with an average haemoglobin value of 89%. These figures give ample proof, if such were needed, of the value of liver (or kidney) in the treatment of pernicious anaemia. In the subsequent statement it will be impossible to

cover the whole ground of Vaughan's review; only those portions which lead to her discussion of the causation of pernicious anaemia will be mentioned.

In regard to achlorhydria, it is pointed out that in all cases in which a test meal has been repeated after some long period of treatment, the achlorhydria has been found to persist, except in two. As far as subacute combined degeneration of the cord is concerned, the earlier reports in regard to improvement in lesions affecting the nervous system were pessimistic; later reports have been more encouraging and it is obvious that length of treatment is an important factor. A bad prognosis for the cord symptoms need not necessarily be given, if there is no improvement coincident with the blood change. Vaughan finds it difficult to offer an explanation for the delay in the response of the nervous system. She points out that the ultimate lesion of subacute combined degeneration of the cord is, as the name suggests, an actual degeneration which, it would be supposed, is irrecoverable. She finds it difficult to understand why the lesions should take so long to improve, if they are at first due to toxæmia, especially when the associated anaemia improves so rapidly. She raises the question as to whether the active liver principle may bear some specific relationship to the nervous system apart from its effect on blood formation. This is, of course, a possibility and the occurrence of cases characterized by subacute combined degeneration and achlorhydria with no history of anaemia and a normal blood picture, apart from a shift of the Price Jones curve to the right, does, as Vaughan states, lend some support to the suggestion. It would appear that it is more reasonable to suppose that the relationship is not between the active liver principle and the cord, but between the cord and the agent which destroys the active liver principle in the first place. In other words, the infective agent, be it streptococcus or other agent, has a dual rôle. It acts on the liver, destroying or interfering with the production of some active principle and in the absence of this active principle interference with blood formation occurs; the infective agent may also have a direct action on the cells of the cord. When liver is given to a patient with pernicious anaemia, the active principle is restored to the patient and blood formation can proceed normally. The action of the infective agent on the cord would not be affected; liver feeding does not destroy the infective agent. If the action of the infective agent on the cord has led to degeneration, there will be no recovery from nervous symptoms. If the action on the cord has resulted only in an inhibition, due to mechanical or toxic causes, there will be some hope of recovery from these symptoms. If recovery occurs, it will be necessary to conclude that the infective agent has either died naturally or been eliminated.

The second group of conditions referred to by Vaughan, is that of the forms of anaemia associated with sprue and pregnancy. These often react to liver therapy in a dramatic manner.

<sup>1</sup>The Quarterly Journal of Medicine, January, 1930.

Vaughan's third group is that of anaemia secondary to haemorrhage. Although liver is not a specific agent in promoting blood formation in anaemia due to haemorrhage, it does in certain instances appear to be of real value. The fourth group comprises anaemia secondary to other conditions. These are very numerous and comprise such entities as leucæmia, Hodgkin's disease, acholuric jaundice, nephritis, tuberculosis, syphilis and so forth. In none of these has liver feeding been found of definite value.

In the discussion on the subject Vaughan refers to the finding of Cohn, Minot, Allies and Salter that the active principle in liver is a nitrogenous base or polypeptide. She points out that recent work suggests that there are probably many factors in liver which affect blood formation and that some of these factors are present in other foods. Whipple has shown that kidney is effective and, as mentioned in a recent issue, good results are claimed from hog's stomach. Vaughan also states that Whipple and his associates and the Wisconsin group of investigators are agreed that the mineral salt content is an important factor, more especially in the iron and copper balance. They agree in finding some summation of effect between these two salts and the Wisconsin group claims that copper alone is effective when iron has failed. The question of copper and anaemia was discussed in these pages on November 16, 1929. Peabody and Muller studied the bone marrow in pernicious anaemia and have shown that the characteristic picture is one of intense proliferation of megaloblasts. On liver feeding the megaloblasts are replaced by nucleated and mature erythrocytes and a normal appearance is gained. Vaughan goes on to state that Muller claims to have demonstrated two factors in liver affecting blood production. One is a substance favouring normal blood production and the other is a substance which inhibits the division of the primitive erythrocyte, the megaloblast. Vaughan concludes that liver contains some substance affecting particularly the development of the megaloblast. It would therefore be expected that liver feeding would exert a powerful action on those forms of anaemia due to disordered production of megaloblasts by the bone marrow. This is what happens. Peabody, as already mentioned, has shown that a hyperplasia of bone marrow is characteristic of pernicious anaemia and the blood picture in sprue and anaemia of pregnancy is so similar to that of pernicious anaemia that they are often indistinguishable. The findings in the bone marrow have been similar. Vaughan states that the fact that the only three conditions in which the Price Jones curve is shifted to the right and in which there is evidence of megaloblastic hypertrophy of the bone marrow, are the three which respond in a characteristic way to liver, suggests that the underlying disturbance is the same, namely, a domination of the megaloblast. She describes the divergent hypotheses of Muller and of Peabody and Minot. Muller believes

that the underlying pathology of pernicious anaemia is an overstimulation of the reticulo-endothelial system characterized by an excessive production of megaloblasts, increased blood destruction and bilirubin formation and that liver acts by inhibiting the production of megaloblasts. Peabody and Minot hold that in pernicious anaemia the liver provides a substance necessary for maturation of the megaloblast. Of these two hypotheses Vaughan appears to prefer the latter. Her discussion need not be followed, for she refers repeatedly to findings in experimental anaemia. Her argument appears sound, but it is unwise to base arguments concerning pernicious anaemia on findings in experimental anaemia, since the two conditions are not strictly comparable.

Reference may be made in conclusion to the view of Castle who suggests that owing to lack of gastric secretion the body is unable to prepare some protein substance essential for proper blood production. This substance is normally stored in liver or kidney and when liver is fed to a patient with pernicious anaemia, the requisite protein is supplied and normal blood production restored. In support of this view he quotes the results of administration of stomach contents removed from a normal person forty-five minutes after a meal of beef muscle. Castle concludes that some enzyme, other than commercial pepsin, working in an acid medium and at present not isolated, is essential and that the absence of such an enzyme is usually associated with absence of free hydrochloric acid. Vaughan then states that it is thus difficult to understand why a small proportion of healthy people have complete achlorhydria and no pernicious anaemia and why so many patients with severe secondary anaemia also have a complete absence of hydrochloric acid. She also adds that the occasional occurrence of true pernicious anaemia in persons with apparently normal gastric secretion cannot be disregarded. Here, as before, Vaughan has not attempted to go to the root of the matter. If pernicious anaemia be regarded as primarily due to an infective organism, most of these difficulties may be explained. Persons with achlorhydria will not be affected unless they receive the infecting organism. If the infective organism is received, it encounters no hydrochloric acid which would kill it and either in the stomach or duodenum it gives rise to toxins which produce a specific action on liver or other organs. The occasional occurrence of pernicious anaemia in persons with apparently normal gastric juice would in these circumstances have to be explained by the inability of the acid in the stomach to kill the organism. The infective view would also explain sprue and the vomiting of pregnancy. Fairley and Mackie have given good reasons for regarding sprue as "due to some infective agency primarily involving the mucosa of the alimentary tract and leading to the degeneration of toxic substances which deleteriously affect the blood elements, bone marrow and parenchymal cells of the internal organs." In vomiting of pregnancy the products resulting from disturbed metabolism would take the place of bacterial toxins.

## Abstracts from Current Medical Literature.

### THERAPEUTICS.

#### Diuretics.

L. G. ROUNTREE (*California and Western Medicine*, August, 1929) discusses the selection of diuretics. In prostatic hypertrophy and polycystic kidney large quantities of water act as a diuretic; in prostatic hypertrophy this should be combined with very gradual decompression of the bladder. In post-operative acute toxic nephrosis with decreased urine and increased blood urea the forced administration of fluids decreases blood urea and "Euphylline" with a salt-free diet reduces the resultant oedema. When a distended urinary or biliary system is relieved by operation, acute toxæmia may occur with increased blood urea and diminished urine. Intravenous injections of 10% glucose solution (one litre) reduces the blood urea and relieves the toxæmia. In the toxæmia of high intestinal obstruction water, salt and glucose given intravenously has a similar effect. When the administration of fluids is forced, oedema and water intoxication occurred with diminished plasma chloride, intravenous administration of chloride and glucose restores the balance. In nephrosis ammonium chloride and "Merbaphen" and urea often reduces oedema; a high protein and low fat diet and thyroid extract are less effective; restriction of water and salt is important. In myocardial insufficiency, rest, restriction of water and salt with digitalis and caffeine derivatives are indicated; urea, "Merbaphen" and ammonium salts are valuable. Sixty to ninety grammes of urea should be used every day. In acute and chronic nephritis with oedema purin derivatives and hypertonic glucose solution are best in acute cases; "Euphylline" and digitalis may be useful in all cases. In the ascites of cirrhosis of the liver, Banti's disease and polyserositis ammonium chloride and "Merbaphen" are indicated.

#### Mortality Following "Avertin" Narcosis.

E. GLAESMER (*Münchener Medizinische Wochenschrift*, December 13, 1929) has carefully reviewed the published cases of deaths following anaesthesia with "Avertin." In some instances the fatal issue was really due to an inoperable condition present in a debilitated patient who succumbed to operative shock. There are definite contraindications to its use in hepatic and renal disease, especially of septic origin. Any combination with other narcotics is dangerous. When morphine is employed as a preoperative sedative, the dose should not exceed 0.01 gramme. Veronal is a better sedative and has no cumulative effects. Following the operation the use of normal saline solution instillations is important in order to assist the rapid

dissociation of "Avertin" from the tissues. When the drug was first employed, many deaths occurred from too great a dose or from toxic solutions. However, both these causes have been overcome as experience was gained in its use.

#### The Use of "Insulin" in the Treatment of Pernicious Anæmia.

L. VON VARGA (*The Lancet*, October 12, 1929) before discussing the treatment of pernicious anæmia by means of "Insulin" draws attention to the fact that favourable results from the use of a protein-free liver extract were first published in a Hungarian medical journal by Jeney. "Insulin" is used by the author to combat the well known loss of appetite found in pernicious anæmia. He reviews this method of treatment in eight cases. The first patient was given "Insulin" alone (sixty units daily). The red corpuscles rose within a month from 770,000 to nearly four millions per cubic millimetre. The next three patients were treated by means of "Insulin" and arsenic, but the results were not better than in the first case. The fifth patient was given thirty units of "Insulin" every day together with one cubic centimetre of "Strychnotonin," a preparation containing arsenic, for the first twenty-four days. The red cells rose from 850,000 to 1,400,000. Calf's liver, 100 grammes a day, was added to the diet and the red cell count rose to four and a half millions. The next patient received "Insulin" only for the first ten days and then "Insulin" together with liver extract. The seventh patient at first responded well to "Insulin" and arsenic, but after a month's progress, the red cell increase and the haemoglobin value became stationary. Liver was then administered with favourable results. The eighth patient was so ill that "Insulin" and liver were administered together from the commencement. The subjective condition of the patient improves in a short time in response to "Insulin" by itself, as well as to the "Insulin"-arsenic and the "Insulin"-liver methods of treatment. The constant anorexia is transformed into bulimia in three to four days by "Insulin." Return of a healthier colour may be looked for on the tenth day. The only symptom which remains uninfluenced is the achlorhydria. The author commences treatment by giving twenty to thirty units of "Insulin" twice a day half an hour before meals and later increases to forty units twice a day. The soundness of the "Insulin" treatment is evident when it is recalled that many authorities regard the cause of pernicious anæmia as being a displacement of the blood reaction in the direction of an acidosis which facilitates haemolysis. "Insulin," on the other hand, increases the alkalinity of the blood. In the eighth case "Insulin" was of life-saving value, as the patient was unconscious and every attempt to feed him failed till he was given "Insulin." The author concludes that, while liver feeding

remedy for pernicious anæmia, "Insulin" must be considered an indispensable auxiliary.

#### Hay Fever.

H. BECKMAN (*Medical Journal and Record*, July 3, 1929) records experiences in the treatment of hay fever with nitrohydrochloric acid. Seventeen patients were treated with ten drops in water four times a day; later a mixture was recommended containing nitrohydrochloric acid 18 mils (four and a half fluid drachms) with distilled water to make 120 cubic centimetres (four fluid ounces). One teaspoonful was taken in three-quarters of a glass of water followed by another glass of water after each meal and upon retiring as near midnight as possible. This dosage was begun at the onset of an attack of hay fever and continued throughout the duration of the season. All seventeen patients were relieved. One hundred and eighty-five patients were similarly treated by other physicians; seventy-five were completely relieved, forty-seven much relieved and sixty-three unrelieved. No ill effects were noted. It is suggested that the benefit obtained was due to the establishment of a slight or partial acidosis.

#### Treatment of Hay Fever.

W. S. VAN LEEUWEN (*Münchener Medizinische Wochenschrift*, December 20, 1929) discusses the treatment of hay fever as far as a general practitioner can carry it out. He emphasizes the necessity for differentiation of the large group of those who suffer only in the summer months, from those who are affected throughout the year. In the former group it is impossible for a practitioner to test the patient with thirty or forty different pollens and the author advises the use of mixed grass and grain extracts only. Greater difficulty arises with the second group both in regard to diagnosis and treatment and these patients are best handed over to specialists. In treatment a strong reaction should be followed by a decreased dose and this should very slowly be brought up to the maximum point of tolerance. This dose is repeated every week at first, then every fortnight and finally every month for one to two years. Failure usually means that other sources of infection, usually flowers, are the causative agents. The most important complication to guard against is polyneuritis, generally heralded by pains in the limbs or fatigue. Cessation of the injections will cure most of these patients and the process is accelerated by injections of sulphur preparations.

#### Local Effects of "Insulin" Injections.

F. DEPIECH (*Wiener Medizinische Wochenschrift*, January 25, 1930) refers to the effect on the site of injection of "Insulin" administered over long periods. In 10% of patients during periods from two months to two years a localized fat dystrophy

occurs as a result of the subcutaneous injections with definite loss of tissue. This is seen much more frequently with women than men. The lesion is partly due to traumatism during injection as well as to a chemical reaction. From his experiments the author does not consider that the tri-kresol in the solution plays any part in the reaction which is due entirely to the "Insulin" and affects the neurotrophic mechanism. The only method of prevention is the use of as many sites of injection as possible.

## NEUROLOGY.

### The Sulfosin Treatment of General Paralysis.

KNUD SCHROEDER (*The Lancet*, November 23, 1929) has found that in general paralysis repeated injections of sulphurated oil (sulfosin), producing a rise of temperature to 40° C. (104° F.) or higher, have a therapeutic effect similar to that of malarial treatment without its dangers and drawbacks. The preparation is a 1% solution or suspension of pure sublimed sulphur in olive oil, sterilized and sealed in ampoules of one to ten cubic centimetres. The injection is made intramuscularly, preferably into the thigh. The initial dose is small (0.5 to 1.0 cubic centimetre) and the dose is increased by about one cubic centimetre at each injection until it eventually reaches ten to twelve cubic centimetres, the temperature meanwhile being carefully recorded. About two injections a week are found convenient and ten injections constitute a series. Two or three series may be needed. Syphilitic lesions of the nervous system other than general paralysis may be similarly treated and the method has been further extended to Parkinsonism, *dementia praecox* and disseminated sclerosis.

### The Corpus Callosum and Its Tumours.

REDVERS IRONSIDE AND MANFRED GUTTMACHER (*Brain*, December, 1929) open their paper with historical, anatomical and physiological considerations to indicate that, whatever else it may be, the *corpus callosum* is the chief internuncial association system between the two halves of the neopallium. They report fourteen case histories of tumours apparently originating in and largely confined to the *corpus callosum*. A study of these cases leads to emphasis of the following groups of symptoms: Hemiplegic weakness with pyramidal signs on the opposite side is frequent and early. Whereas great stress has been laid upon apraxia as a physical sign, it was not a prominent feature in their cases and was found in hardly more than 10%. The mental changes which are so commonly present, are often the first symptom. Apathy, drowsiness and defect of memory are met with more commonly than in growths elsewhere and occur with such regularity

in the *corpus callosum* syndrome as to be characteristic. Epileptiform convulsions in their series were relatively frequent and they draw attention to other involuntary movements, tremulous and choreiform, which were noted throughout their cases. The occurrence of yellow cerebro-spinal fluid in four of the patients was regarded as of considerable importance. In the main the general symptoms of cerebral tumour were in abeyance, so that the diagnosis during life in most of the cases was that of cerebral vascular disease. Since diagnosis alone is largely conjectural, it is evident that localization to particular parts of the *corpus callosum* can only rarely be successful. In differential diagnosis cerebral arteriosclerosis, *dementia paralytica*, tumours elsewhere and multiple tumours of the brain must be considered. Surgical treatment may be tried when diagnosis has been made at an early stage; in other circumstances deep X rays may be applied.

### Encephalomyelitis Following Vaccination.

CECIL D. COYLE AND E. WESTON HURST (*The Lancet*, December 14, 1929) record the clinical features and results of autopsy and microscopic examination in a case of post-vaccinal encephalitis. The subject was a female child, aged five years. She was in hospital convalescing from pneumonia when another child, admitted on the previous day, developed the rash of small pox. The ward was quarantined and fifteen contacts including the patient who is the subject of this record, were vaccinated. On the thirteenth day after vaccination the patient was noticed to be excited, running about and striking other children. On the day following she complained of pain in the limbs and headache and had a temperature of 38.6° C. (101.6° F.). Rapidly thereafter she became increasingly drowsy, showed indefinite nervous signs (ptosis, cervical rigidity and *tâche cérébrale*), was finally comatose and died two days after the beginning of her acute illness and fifteen days after vaccination. The clinical picture is said to accord with the description of similar cases published by others. Histologically the lesions also conformed to the descriptions given by others of that disseminated encephalomyelitis which during recent years has been noted as following vaccination against small pox. One unusual feature was that the cord lesions were found to be almost entirely confined to one side; this, however, was not the vaccinated side. The other children vaccinated on the same day showed no ill effects, with the exception of one who had an indeterminate pyrexial attack.

### Congenital Auditory Imperception or Word Deafness.

C. WORSTER-DRAUGHT AND I. M. ALLEN (*Journal of Neurology and Psychopathology*, January, 1930) describe a case of what they regard as "congenital auditory imperception," preferring this term to "congenital word

deafness." The subject was a boy of twelve years in whom complete word deafness or more strictly word-meaning deafness was the most important element, but in whom there also existed some degree of auditory agnosia, slight word blindness, slight agraphia or dysgraphia and a pronounced speech defect as associated elements. The speech defect took the form of so-called "idioglossia," an "individual language" representing an extreme form of mispronounced and ill-expressed conventional language. The writers thought the case illustrated the interdependence of each and every elemental part of the speech mechanism and especially the dependence of normal speech development upon the appreciation of variations in sounds. They also agreed with the modern view that the speech mechanism could not be divided into clearly defined "centres," but functioned as a complete whole. As regards the cause of the disorder, the balance of evidence was in favour of a biological variation or of local aplasia, but birth injury could not be definitely excluded. The case raised important questions, such as the influence of congenital "word deafness" upon the development of "idioglossia" and general intelligence.

C. WORSTER-DRAUGHT AND I. M. ALLEN (*Journal of Neurology and Psychopathology*, January, 1930) review and discuss the condition known as congenital word deafness. The clinical features of the defect are as follows. The incidence in boys is much greater than in girls, there is a familial factor in about one-third of the cases, there is inability to appreciate the significance of spoken words and there are slight defects in the appreciation of written and printed symbols, absence of or defects in speech and defects in writing and spelling resembling those in speech. These features occur in a child whose ordinary hearing and other functions are normal. The condition is due primarily to a defect on a lower level of function than that which results in true aphasia and may be more correctly termed "congenital auditory imperception" than "congenital word deafness." It is probable that parts of the brain concerned with auditory reception are absent or defectively developed and the changes are bilateral. The fundamental defect is inability to appreciate the significance of the spoken word (word-meaning deafness) and the associated defects in speech, visual appreciation and writing are comparable with Head's "verbal aphasia." Such children are potentially normal from a mental point of view, but may be thought to be defective. In a poor environment and in the absence of sympathetic education they may become imbeciles from deprivation, even antisocial and delinquent. Early diagnosis and education are essential, but education is difficult because it must be through channels other than the auditory. The condition is relatively infrequent and much less common than congenital word blindness.

## British Medical Association News.

### SCIENTIFIC.

A MEETING OF THE SOUTH AUSTRALIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Darling Building, University of Adelaide, on February 27, 1930, DR. H. GILBERT, the President, in the chair.

#### Cancer of the Stomach.

DR. C. T. CH. DE CRESPIGNY read a paper entitled "Cancer of the Stomach" (see page 549).

SIR HENRY NEWLAND read a paper on carcinoma of the stomach, in which he discussed the early diagnosis of the condition.

DR. H. A. MCCOY referred to the inadequacy of the usual radiological methods for the demonstration of early lesions of the stomach. In the absence of a definite filling defect, "fleck," incisura or a gross abnormality in motility, it was unusual to diagnose an organic lesion by radiological methods.

Fränkel had described a method by which he contended that he was able to recognize organic lesions in the stomach at a very early stage. This method known as the cross bar symptom depended for its success on the fact that peristaltic waves do not pass through infiltrated stomach muscle. Fränkel showed graphs demonstrating his method. Operative proof of the presence of very small lesions had been obtained in several cases and the undoubted value of the method appeared proven. It was deserving of further investigation.

DR. E. McLAUGHLIN in describing various types of test meals employed in the investigation of gastric function, said that the Ewald meal could no longer be regarded as satisfactory, since a high percentage of free hydrochloric acid was sometimes secreted after the period of one hour. To detect the absence of free hydrochloric acid a fractional test meal was necessary.

He expressed the opinion, however, that for ordinary diagnostic purposes specimens need be withdrawn only at half hourly intervals. The presence of lactic acid in the resting gastric juice was not essential for the diagnosis of carcinomas of the stomach. Indeed its presence usually indicated a late stage in the condition. There was abundant evidence that an acid curve, even reaching high normal limits, was sometimes found in carcinoma of the stomach. However, this was a rare finding; so that achlorhydria was merely suggestive evidence.

To what extent the mere presence of carcinoma in the stomach affected the secretory function of the stomach was not clearly understood. It had been suggested that the condition of achlorhydria frequently preceded the appearance of the carcinoma. It could not be claimed, therefore, that in early carcinoma a test meal was more than suggestive. It should be remembered, however, that normal findings were frequently as important as positive ones. For instance the absence of blood in the resting gastric juice was probably against the diagnosis of carcinoma of the stomach.

He then described various types of anaemia associated with carcinoma of the stomach. He doubted whether the patient in the early stages developed any considerable degree of anaemia. Three types were found, simple secondary anaemia, an anaemia of the pernicious type and one of the haemorrhagic type.

The differential diagnosis from pernicious anaemia could sometimes be arrived at by the therapeutic test. These patients did not respond to liver diet.

He considered that the presence of occult blood in the faeces was of great importance. The continued absence was very much against the presence of carcinoma in the alimentary tract.

In conclusion he pointed out that clinical pathological tests were never of themselves diagnostic. Since the alteration of gastric secretory function in the early stages of carcinoma was imperfectly understood, he suggested that performance of a fractional test meal in all suspicious cases might lead to useful results.

DR. F. S. HONE said that the whole question turned on what was meant by early diagnosis. Presumably this meant the diagnosis was made at a stage where there was a justifiable hope of cure by treatment. In the present state of our knowledge this could only be by operative measures, whatever the future might hold for treatment by radium. In that case he suggested with all deference that the opening papers dealt with diagnosis in a stage subsequent to what could be called early diagnosis. A feature that had not been touched on, was that of cost to the patient. He remembered a discussion by the Branch on the same subject many years before in which the necessity for early surgical exploration of all middle aged patients with dyspeptic symptoms was urged. He had been impressed then with the difficulty of justifying the cost to the patient when negative results were secured. They had fortunately passed beyond that method of diagnosis. He himself of recent years had been impressed with the value of fractional test meals in making diagnosis possible earlier than was previously the case. This could be supplemented by an X ray examination after a barium meal, if required. With the discovery of fairly high acid curve cancer of the stomach could be practically ruled out of court, although symptoms might still be due to cancer elsewhere. Achlorhydria or a very low acid curve would lead to further investigation; even here in cases which gave normal results, the question of unnecessary cost came up.

He had been impressed with the difficulty of ascertaining how long a cancer of the stomach would be present before it set up a functional disturbance. Cancer of the skin or lip was diagnosed by sight; cancer of the tongue or *cervix uteri* caused early disturbance of function which directed attention to the local trouble; with cancer of the stomach the trouble in early diagnosis seemed to arise from the fact that unless it was situated close to the pylorus, it could attain a large size before setting up those disturbances of function which were the cause of the individual seeking medical advice.

He asked had any of the surgeons present ever discovered a small malignant growth in the stomach wall in searching for other abdominal conditions? At how early a stage in the growth was it related to alterations in gastric secretion? This and similar questions needed to be answered before they could progress much further in very early diagnosis of this condition.

DR. OWEN MOULDEN brought up the question of secondary anaemia in carcinoma of the stomach. In a patient, whom he had recently attended, the outstanding feature had been a pronounced degree of secondary anaemia, the haemoglobin content having been 27%. There had been no digestive symptoms of any sort and there had been no pain. No occult blood had been demonstrable in the stools and no other cause for the anaemia had been found.

Treatment with iron and arsenic had been given and at the end of three months the haemoglobin content had been 65%. Shortly afterwards a mass had become palpable in the abdomen slightly to the right of the umbilicus. Operation had revealed a carcinoma of the pyloric antrum. Partial gastrectomy had been performed. In this case radiological examination of the stomach had been delayed for over three months on account of the response of the secondary anaemia to the administration of iron and arsenic. Dr. Moulden asked Sir Henry Newland and Dr. de Crespigny whether they had noted this phenomenon.

DR. J. S. VENCO said that the great majority of carcinomas were well advanced when referred for X ray examination. Dr. Searby in discussing one hundred and sixty cases of verified cancer of the stomach had stated that there were over 70% of these carcinomas so situated that if the diagnosis were made reasonably early, some form of resection could be performed. In regard to the help and information which might be given from an X ray exam-

ination of a patient with early carcinoma of the stomach, the examination should reveal the evidence of an intrinsic tumour of the stomach, if present. The position of the stomach would be shown, whether large, pendulous and low in the abdomen or high up toward the costal margins. The evidence should be forthcoming as to what segment of the stomach was invaded by the tumour, whether the pyloric or the mid-segment, the lesser or greater curvature or the upper segment. The localization of site alone would class some tumours as definitely inoperable. There should be revealed some indication of the size of the tumour, though the surrounding infiltration could not be definitely gauged.

In regard to X ray evidence from opaque meal examination, in nearly all cases, except leather bottle stomach, there was some lessened motility shown clearly by a delay in the emptying of the stomach and sometimes a small pyloric tumour would give rise to stenosis of the stomach outlet more or less completely. There were several other causes of delay in emptying the stomach, some direct, as in cicatricial stenosis and some indirect as in some pathological conditions of the gall bladder. When there was evidence of unusual delay in emptying, carcinoma should be excluded as a cause. When there was an intrinsic tumour present there would be a filling defect in the shadow of the stomach and care should be taken to make the examination from different angles. The filling defect might be smooth, but more often it was irregular and sometimes in the shape of a large ulcer with a niche and it was outside the sphere of the radiologist to decide whether a large ulcer was or was not malignant. An infiltration of the stomach wall without tumour formation to any extent would interfere with peristalsis and this was said to give one of the earliest signs of carcinoma, namely an interference with the peristaltic wave in that it did not "go through" a certain portion of the stomach. It could be detected only when the affected portion was seen in profile. Early diagnosis of carcinoma of the upper third was more difficult and the patient should be examined in the horizontal position or with head lower than the feet, so as to fill completely the cardiac end of the stomach or a filling defect might be found when none was present. In the pyloric region it was possible to observe a filling defect before a tumour was palpable through the abdominal wall. In the greater curvature probably the filling defect and palpable tumour occurred about the same time. Apparent filling defects might be caused by deformities of the stomach from adhesion bands, from extrinsic pressure or from retained food in non-malignant stenosis of the stomach outlet; as a rule there was not great difficulty in excluding these causes by making the examination in different planes and during palpation.

The radiologist should realize the gravity of missing an early malignant condition of the stomach and should take care before and during screening to see that the room was properly darkened and that his eyes had had sufficient preparation for clear screening.

The X ray evidence was only a portion of that which went to make the clinical diagnosis; sometimes it was suggestive of a carcinoma; at other times the X ray picture was normal. When with X ray examination and other methods there was inconclusive evidence and yet suspicious symptoms persisted, the patient should be examined again with X rays in the near future. In some few cases the X ray evidence was so definite and conclusive that in all suspicious cases this method of examination should be available.

#### NOMINATIONS AND ELECTIONS.

THE undermentioned has been nominated for election as a member of the New South Wales Branch of the British Medical Association:

Stening, George Grafton Lees, M.B., B.S., 1927 (Univ. Sydney), Royal Hospital for Women, Paddington.

THE undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

- Dalton, Reginald Thomas, M.B., B.S., 1929 (Univ. Sydney), Bundarra, New South Wales.
- Grey, William Scoboria, M.B., 1929 (Univ. Sydney), 57, Dudley Street, Lidcombe.
- Jones, Reginald Stuart, M.B., Ch.M., 1926 (Univ. Sydney), F.R.C.S., 1929 (Univ. Edinburgh), 10, William Street, Double Bay.
- Lane, Albert Stephen, M.B., 1928 (Univ. Sydney), 43, Victoria Street, Roseville.
- See, Douglas Harry Kedgwin, M.B., 1929 (Univ. Sydney), Commonwealth Department of Health, Tropical School, University of Sydney.
- Noad, Kenneth Beeson, M.B., Ch.M., 1924 (Univ. Sydney), Grassmere Road, Neutral Bay.
- Stening, George Grafton Lees, M.B., B.S., 1927 (Univ. Sydney), Royal Hospital for Women, Paddington.
- Symington, Norman John, M.B., Ch.M., 1926 (Univ. Sydney), 315, Mowbray Road, Chatswood.
- Tarlington, Kevin Faulkner, M.B., 1925, Ch.M., 1927 (Univ. Sydney), Gilgandra, New South Wales.

#### Medical Societies.

##### THE MEDICAL BENEVOLENT ASSOCIATION OF NEW SOUTH WALES.

THE following reports of the Honorary Secretary and the Honorary Treasurer of the Medical Benevolent Association of New South Wales have been forwarded for publication.

###### Honorary Secretary's Report.

The operations of the year have resulted in a surplus of £149 10s. 1d., after paying £455 to beneficiaries. As £157 10s. was received from Life Members, it is certain that more annual subscribers are required, if the beneficiaries are to receive the same help in the future as in the past. The assistance given is just enough to furnish the bare necessities of life. Money is also wanted to help in the education of children. Each case coming before the Council is carefully considered before any money is voted.

The generous support of many members of the profession has greatly encouraged the Council in the discharge of its duties. Some of the letters received in answer to a request for a subscription have been of a most cordial and appreciative nature. The Council feels that its efforts are meeting with the cordial support of the members of the medical profession in New South Wales.

J. M. GILL,

Honorary Secretary.

January 28, 1930.

###### Honorary Treasurer's Report for Year Ending December 31, 1929.

It will be seen from the balance sheet that we have a credit balance this year of £149 10s. 1d. Our life members now number 95 (an increase of 15), and our annual subscribers 250 (an increase of 44). We need double the number of annual subscribers to place the Association on a satisfactory financial basis.

Owing to the liberal response to the Christmas Gifts Fund Appeal in 1928, we had a balance of £77 6s. 6d. for this year, and therefore made no further appeal. Christmas gifts for this year absorbed £70 of this sum, leaving a balance of £7 6s. 6d. to the credit of the fund.

We beg to thank the Northern Districts Medical Association, the Eastern Suburbs Medical Association, the Illawarra Suburbs Medical Association, and the Western Suburbs Medical Association for their generous and most welcome help.

## Balance Sheet as at December 31, 1929.

LIABILITIES.	£ s. d.	ASSETS.	£ s. d.
Capital Account as at December 31, 1928 ..	1,759 15 5	Cash Accounts—	
Add Surplus for year ended December 31, 1929, as per Income and Expenditure Account .. . . . .	149 10 1	Government Savings Bank of New South Wales (Current Account) .. . . . .	234 9 1
		Government Savings Bank of New South Wales (Deposit) .. . . . .	274 16 5
		Investments—	
		New South Wales Government Funded Stock, 5½%, 1941 .. . . . .	900 0 0
		Commonwealth Government Subscribed Stock, 5½%, 1943 .. . . . .	500 0 0
	£1,909 5 6		£1,909 5 6

## Income and Expenditure Account for Year ending December 31, 1929.

EXPENDITURE.	£ s. d.	INCOME.	£ s. d.
To Assistance to Beneficiaries .. . . . .	385 0 0	By Donations .. . . . .	124 16 6
Christmas Gifts to Beneficiaries .. . . . .	70 0 0	Annual Subscriptions (250) .. . . . .	262 10 0
Printing and Stationery .. . . . .	19 11 6	Life Subscriptions (15) .. . . . .	157 10 0
Stamps .. . . . .	10 12 11	Exchange added .. . . . .	1 3 6
" Exchange .. . . . .	1 16 6	Interest on Investments .. . . . .	83 16 1
" Typing .. . . . .	1 13 6	Christmas Fund Appeal .. . . . .	9 7 0
" Cash Book .. . . . .	0 0 3		
" Cheque Book .. . . . .	0 8 4		
" Bank Charge .. . . . .	0 10 0		
" Surplus for Year added to Capital Account	149 10 1		
	£639 3 1		£639 3 1

JOHN MACPHERSON  
M. O'GORMAN HUGHES } Honorary Auditors.  
January 16, 1930.

E. S. LITTLEJOHN,  
Honorary Treasurer.  
January 1, 1930.

We are also deeply indebted to several private donors.  
In order to have none of our funds lying idle, our current account has been transferred from the Commercial Bank to the Government Savings Bank.

E. S. LITTLEJOHN,  
Honorary Treasurer.  
January 1, 1930.

June 16, 3 p.m.—Dr. H. Poate, at the Royal Prince Alfred Hospital.

June 26, 3 to 4.30 p.m.—Professor J. Windeyer, at the Royal Hospital for Women, Paddington.

## POST-GRADUATE COURSE IN SYDNEY.

THE following syllabus has been drawn up in connexion with the post-graduate course of study to be held in Sydney from May 26 to June 6, 1930. The course will be under the direction of the New South Wales Branch of the British Medical Association and the fee for attendance will be four guineas.

Monday, May 26, 1930.  
At Sydney Hospital.

9.30 to 11 a.m.—Registration, Honorary Medical Staff Room.

11.15 a.m. to 12.45 p.m.—Dr. G. Willcocks: Recent advances in the diagnosis and treatment of some common diseases.

Dr. G. Bell: Fractures of the lower extremity and skeletal traction.

2.15 to 3.30 p.m.—Dr. L. Johnston, Dr. N. Paul, Dr. G. Hamilton: Skin diseases of general practice.

Dr. R. Bridge: A demonstration of pyelography.

3.30 to 5 p.m.—Dr. H. Stacy: Head injuries.

Dr. H. J. Ritchie: High blood pressure.

Tuesday, May 27, 1930.

Morning, at Lewisham Hospital.

9.30 to 11 a.m.—Dr. N. D. Royle, Dr. R. V. Graham: Demonstration of the treatment of fractures by the three plaster method.

Dr. H. Harris, Dr. R. G. Harris: Treatment of enlarged prostate—suprapubic prostatectomy. Film.

## Post-Graduate Work.

## CLINICAL DEMONSTRATIONS IN SYDNEY.

ARRANGEMENTS have been made for regular weekly clinical demonstrations to be held at the metropolitan hospitals. A demonstration will be held each week at one of the hospitals and medical practitioners are invited to attend free of charge. The following demonstrations will be held, commencing Friday, May 2, 1930.

May 2, 3.30 to 5 p.m.—Professor A. E. Mills, at the Royal Prince Alfred Hospital.

May 5, 2.30 p.m.—Dr. J. McKelvey, at Saint Vincent's Hospital.

May 12, 3.30 to 5 p.m.—Dr. E. Ludowici, at The Women's Hospital, Crown Street.

May 19, 3.30 to 5 p.m.—Dr. H. Ritchie, at the Sydney Hospital.

May 28, 3.30 to 5 p.m.—Dr. A. Aspinall, at the Sydney Hospital.

June 2, 3.30 to 5 p.m.—Dr. E. Stephen, at the Royal Alexandra Hospital for Children.

June 13, 3.30 to 5 p.m.—Dr. C. B. Blackburn, at the Royal Prince Alfred Hospital.

- 11.15 a.m. to 12.45 p.m.—Dr. J. Hoets: Diathermy.  
Dr. T. W. Lipscomb: Gynaecology in general practice.  
*Afternoon, at Royal Alexandra Hospital for Children.*  
2.15 to 3.30 p.m.—Dr. W. A. Dunn, Dr. H. G. Humphries, Dr. L. G. Tait: Enucleation of tonsils, Sluder's method.  
Dr. E. Stephen, Dr. C. McIntosh: Medical cases in wards.  
3.30 to 5 p.m.—Dr. P. L. Hipsley: Intussusception.  
Dr. M. J. Plomley: Gastro-enteritis.

**Wednesday, May 28, 1930.***At the Royal Prince Alfred Hospital.*

- 9.30 to 11 a.m.—Dr. C. B. Blackburn: Arthritis, clinical demonstration.  
Dr. B. T. Edye: Selected surgical cases.  
11.15 a.m. to 12.45 p.m.—Dr. L. G. Teece, Dr. E. Vance: Orthopaedic Department.  
Dr. A. J. Collins: Asthma.  
2.15 to 3.30 p.m.—Dr. M. Lidwill: Demonstration of cardiovascular cases.  
Dr. H. Poate: Surgical diseases of the thyroid.  
3.30 to 5 p.m.—Dr. H. Schlink, Dr. F. A. Maguire: Selected gynaecological cases.  
Dr. E. Fairfax: Diseases of the chest; clinical demonstration with X ray films.  
8.15 p.m.—Lecture<sup>1</sup> by Professor F. Wood Jones: "Structure and Function in Practical Medicine."

**Thursday, May 29, 1930.***Morning, at Tresillian Mothercraft Training School.*  
9.30 a.m. to 12.45 p.m.—Dr. Margaret Harper, Dr. L. G. Tait: Infant feeding and mothercraft.

- Afternoon, at Royal Alexandra Hospital for Children.*  
2.15 to 3.30 p.m.—Dr. R. B. Wade: Selected surgical cases.  
Dr. R. A. R. Green: Diphtheria.  
3.30 to 5 p.m.—Dr. W. Vickers: Demonstration of splints. The diet kitchen.  
8.15 p.m.—Meeting of the New South Wales Branch of the British Medical Association: Indications for the induction of abortion (i) in heart disease in pregnancy, (ii) in tuberculosis in pregnancy, (iii) in mental disease.

**Friday, May 30, 1930.***At Saint Vincent's Hospital.*

- 9.30 to 11 a.m.—Dr. V. M. Coppleson, Dr. D. Miller: Clinical demonstration, including injection treatment of varicose veins and tannic acid treatment of burns.  
Dr. B. P. Anderson Stuart: Demonstration of X rays.  
11.15 a.m. to 12.45 p.m.—Dr. J. Tansey: Selected medical cases.  
Dr. D. J. Glissan: Splints and application of plaster bandages.  
2.15 to 3.30 p.m.—Dr. G. Pockley: Diseases of the eye in general practice.  
Dr. J. McKelvey: Selected surgical cases.  
3.30 to 5 p.m.—Dr. B. J. Harrison: Deep X ray therapy: Demonstration of cases and appliances.  
Dr. W. Maxwell: Clinical demonstration.  
8.15 p.m.—Lecture<sup>1</sup> by Professor F. Wood Jones: "Structure and Function in Practical Medicine."

**Saturday, May 31, 1930.***At the Coast Hospital.*

- 10 a.m. to 12 noon.—Dr. R. McMaster: The infectious diseases.

**Tuesday, June 3, 1930.***At the Royal Prince Alfred Hospital.*

- 9.15 to 11 a.m.—Professor A. E. Mills: Clinical demonstration.

- Dr. R. K. Lee Brown: Urological clinic.  
11.15 a.m. to 12.45 p.m.—Dr. H. Sear, Dr. W. Dight: Radiological demonstration.  
Dr. J. C. Storey: The nature and treatment of inflammation.  
2.15 to 3.30 p.m.—Professor W. S. Dawson: Neurologic and psychiatric cases.  
Dr. F. P. Sandes: The radium treatment of cancer—clinical demonstration.  
3.30 to 5 p.m.—Dr. A. Tebbutt, Dr. F. Hansman: Common laboratory tests.  
Dr. R. Godsall, Dr. G. Halloran: Diseases of the ear, nose and throat in general practice.  
8.15 p.m.—Lecture<sup>1</sup> by Professor F. Wood Jones: "Structure and Function in Practical Medicine."

**Wednesday, June 4, 1930.**

- Morning, at the Royal Hospital for Women, Paddington.*  
9.30 to 11 a.m.—Professor J. C. Windeyer: Antenatal methods.  
Dr. C. D'Arcy: The toxæmias of early pregnancy.  
11.15 a.m. to 12.45 p.m.—Dr. P. Hipsley: The accidents and diseases of the new born.  
Dr. F. Brown Craig: Puerperal sepsis.

*Afternoon, at the Royal North Shore Hospital.*

- 2.30 to 5 p.m.—Dr. Cotter Harvey, Dr. A. J. H. Stobo: Demonstration of the work of the clinic for pulmonary diseases, including radiographs, artificial pneumothorax and demonstration of cases.

**Thursday, June 5, 1930.**

- Morning, at the Women's Hospital, Crown Street.*  
9.30 to 11 a.m.—Dr. E. Ludowici: The toxæmias of pregnancy.  
Dr. H. C. E. Donovan: Intercurrent diseases of pregnancy.  
11.15 a.m. to 12.45 p.m.—Dr. A. J. Gibson: Antenatal methods.  
Dr. D. Bowman: The treatment of septic abortion.

- Afternoon.*  
Operations at the hospitals and demonstration of special methods of anaesthesia.  
8.15 p.m.—Lecture<sup>1</sup> by Professor F. Wood Jones: "Structure and Function in Practical Medicine."

**Friday, June 6, 1930.***At Sydney Hospital.*

- 9.30 to 11 a.m.—Dr. L. Dunlop: *Diabetes mellitus*.  
Dr. R. Sharp: Clinical demonstration.  
11.15 a.m. to 12.45 p.m.—Dr. W. Evans: Modern methods in the diagnosis and treatment of heart disease.  
Dr. A. J. Aspinall: The treatment of urgent accident cases.  
2.15 to 3.30 p.m.—Dr. H. Bullock: Demonstration of surgical cases.  
Dr. H. C. Adams: Selected medical cases.  
3.30 to 5 p.m.—Dr. Holmes à Court: Clinical demonstration.  
Dr. C. Bowker, Dr. C. Robertson, Dr. R. I. Furber: Selected gynaecological cases.

Arrangements have been made with Professor Wood Jones, of Melbourne, to deliver a course of lectures concurrently with the post-graduate course. The subject of the lectures will be: "Structure and Function in Practical Medicine." The fee for these lectures will be two guineas, but for those attending the post-graduate course or for resident medical officers of hospitals the fee will be one guinea.

Applications to attend the post-graduate course or the lectures by Professor Wood Jones should be made before May 14, 1930, to the Secretary, Post-Graduate Work Committee, New South Wales Branch of the British Medical Association, Government Savings Bank, 21, Elizabeth Street, Sydney.

<sup>1</sup> Professor Wood Jones's lectures constitute a separate course.

### LECTURES IN MELBOURNE.

THE Melbourne Permanent Committee for Post-Graduate Work has arranged with Professor Evarts Graham, Professor of Surgery, Washington University School of Medicine, St. Louis, United States of America, to deliver a course of six lectures in Melbourne during the latter half of July, 1930.

Professor Graham is known in Australia chiefly in connexion with his work on diseases of the gall bladder and on cholecystography. He has also contributed largely to the advancement of surgery of the chest. Full details of the lectures are not yet available, but it is expected that three lectures will be devoted to the biliary tract and three to thoracic conditions.

### ANNUAL REFRESHER COURSE IN MELBOURNE.

THE annual refresher post-graduate course arranged by the Melbourne Permanent Committee for Post-Graduate Work will be held during the latter half of July, 1930, concurrently with the course of lectures to be delivered by Professor Graham. Full details will be announced at a later date.

### The Armit Fund.

THE late Henry William Armit whose sudden death occurred after a very short illness on March 12 last, came to Australia in 1914 at the invitation of The Australasian Medical Publishing Company, Limited, to become Editor of the journal, which position he had occupied ever since. In addition it was largely due to his efforts that The Printing House of the company was established and he was Manager for over two years as well as being Editor of the journal.

The question of recognition by the profession of the services rendered by the late Dr. Armit was considered at a recent meeting of the Board of Directors. As is well known, Dr. Armit laboured unstintingly for the profession for fifteen years; he was always approachable by any and every one who wanted help or advice in professional work or research or in publication. He was especially helpful in making available full and correct references to those who desired them in connexion with any special subject. In consequence much of his journalistic work was carried home to be done at nights and week-ends and little thought did he give for the future. To compensate in some way to his widow and daughter for the sacrifices he has made, it has been decided to open a fund for contributions. It is confidently expected that a great many practitioners will welcome the opportunity of showing in some way their appreciation of his services. Contributions may be sent to "The Armit Fund," care of the Honorary Secretary of each individual Branch in Australia who will forward them on to the Secretary of The Australasian Medical Publishing Company, Limited, 21, Elizabeth Street, Sydney, or contributions may be sent direct to the Secretary of the Company. The names of contributors will be acknowledged in THE MEDICAL JOURNAL OF AUSTRALIA.

T. W. LIPSCOMB,

Chairman,

The Australasian Medical Publishing Company, Limited.

### University Intelligence.

#### THE UNIVERSITY OF SYDNEY.

A MEETING OF THE SENATE OF THE UNIVERSITY OF SYDNEY was held on April 7, 1930.

The following degrees were conferred:

*In person:*

Bachelor of Medicine and Bachelor of Surgery (M.B., B.S.):  
Bayldon, Francis Wood.  
Broome, Kenneth Hamilton.  
Larkin, Edward Henry.  
Owen, Alexander.

Bachelor of Medicine (M.B.):  
Gunther, Carl Ernest Mitchelmore.

*In absentia:*

Bachelor of Medicine (M.B.):  
Armstrong, Keith Boyce.  
Gaffney, Thomas Joseph.

A cheque for £100 was received from Dr. H. G. Chapman (Director of Cancer Research) for the foundation of a prize to be awarded for an essay embodying the results of original research in physiology.

The Professor of Chemistry reported that he had received from Mr. F. Wright, of Messrs. Elliott Bros., as a gift to his department, a letter written by the late Professor Faraday.

A donation of £10 was received from Mr. D. Radford, B.A., towards the funds of the Department of Urology.

The Agent-General for New South Wales advised that Professor H. D. Wright (Bosch Professor of Bacteriology) would arrive in Sydney on September 1 and Professor C. G. Lambie (Bosch Professor of Medicine) on July 31.

Approval was given to a special academic dress for the President and Councillors of the Students' Representative Council, to be worn only during their term of office.

By a unanimous vote the Senate re-elected Sir Mungo MacCallum, K.C.M.G., to the office of Deputy Chancellor for the ensuing twelve months.

The following appointments were approved:

Dr. J. C. Storey as Lecturer in Clinical Surgery at the Royal Prince Alfred Hospital.

Dr. Walter Perry as Tutor in Surgery at Saint Vincent's Hospital.

Mr. K. C. Richardson, B.Sc., as Lecturer and Demonstrator in the Department of Anatomy.

It was resolved to admit Miss Hazel Claire Weekes, B.Sc., to the Degree of Doctor of Science for her thesis entitled "Placentation Amongst Reptiles and its Possible Bearing upon the Evolutionary History of Mammals." The examiners reported that the thesis was an original contribution of distinguished merit, adding to the knowledge and understanding of zoology. Miss Weekes (the first woman to be awarded the degree of Doctor of Science of Sydney University) graduated B.Sc. in 1926, with first-class honours in zoology. She was the holder of a Linnean Macleay Fellowship from 1927 to 1929, and having recently been awarded a Rockefeller Fellowship, has proceeded to England to continue her research work.

### Correspondence.

#### MEDICAL ETHICS.

SIR: Before that excellent and restrained letter from "Merely a G.P." is forgotten, should we not consider whether the orthodox attitude of the profession is the correct one or if it is really the considered opinion of the profession at all and moreover whether that attitude is for the general good?

It is generally thought, by ourselves at least, that the general body of the medical profession is at least as well informed upon matters of public health as the average non-medical writer.

It has always been important that the public should be taught to protect itself from all dangers which are preventable.

How, then, can the profession avoid its plain duty, that of acting as mentor in these days of unceasing discovery? The press and the cinema have taken the place of the pulpit and the rostrum; the profession should use the tools ready to its hand.

Personal advertisement must be sternly discouraged, but inspired pronouncements upon public affairs would be welcomed by an enlightened press and do incalculable good. At the present time, when our statesmen have been wise enough to call attention to public and private waste and to the value of a study of economics in public and private life, a well written plain statement of food values showing how easily and cheaply a proper diet of full calorific value can be prepared in Australia from wholesome but low priced materials, would be worthy of a column in even a penny halfpenny newspaper.

Some advice upon the vexed question of clothing in this (more or less) glorious climate would prove at least amusing to our younger set and might mayhap reduce our pneumonia percentages.

A simply written description of the anatomy of the female foot with reference to modern "footwear" would not do any kind of good, but would explain to our wives and sweethearts how it comes about that chiropodists prefer Cadillacs.

The newspaper reading public, that is all of us, demand medical "news." Why should they not get it as good as we can make it for them?

"Merely a G.P." rightly again calls attention to the slight shown to the President of the Institute of Journalists. May one ask again: Is it too late to review that mistake? Or must we take the cumbersome method of "making a recommendation to Council"?

Yours, etc.,

"ANOTHER G.P."

April 11, 1930.

#### DIATHERMY OF TONSILS.

Sir: The letter of Dr. Pern in the last issue of the journal rather gives the impression that removal of diseased tonsils by diathermy is the ideal method for all patients except young children. Before accepting this it is better to review the present state of our knowledge.

With modern refinements of technique, anaesthesia either local or general according to the surgeon's preference is entirely satisfactory. This with improved gags, mechanical suction apparatus *et cetera* has made the complete removal surgically of tonsils a safe and certain procedure. This method necessitates admission to hospital, discomfort in the throat for a varying period up to four days, which can be relieved by treatment, and incapacity from employment for a week. Still this method, properly carried out, means a permanent and complete removal of the diseased tissues.

Regarding treatment by diathermy I have had lately the opportunity of examining several patients both here and in Melbourne upon whom this method has been employed. In none was complete removal of the tonsillar tissue achieved, but the remaining tissue appeared healthy and most patients reported themselves as relieved of the symptoms for which the treatment had been undertaken. The hyperæmia induced by the diathermy probably sterilizes the remaining lymphoid tissue and this would explain the healthy appearance of it. Whether this is a permanent change time alone will show. Formerly when tonsillotomy was the routine operation, relief of symptoms frequently occurred for varying periods up to years; but ultimately many of these patients required complete enucleation. Concerning the patients' experiences several had had discomfort up to forty-eight hours after the first and sometimes subsequent treatments. Secondary hemorrhage has occurred usually as a result of too much being done at a sitting. Hæmorrhage after diathermy is a very worrying and dangerous happening, as the patient is usually at home and away from expert assistance. Further, control of the bleeding in the sloughing tissue is not easy. In order to prevent the occurrence of secondary hemorrhage and discomfort small areas only must be treated

at each sitting and time must elapse between treatments to allow of healing. This necessitates several treatments over a prolonged period. The question of permanency of the results can only be proved in time and in my opinion sufficient time has not yet elapsed to determine this.

While at the Pan-Pacific Surgical Congress last year, I took the opportunity to discuss this method with the American specialists present and it seemed that this method is being discarded after trial and that surgical removal is the rule.

In conclusion diathermy is useful and the best method of treatment when there is any contraindication to surgical enucleation; but it should not supersede the latter, as it is slower, less certain and less safe.

Yours, etc.,

RICHARD FRANCIS,  
M.B., Ch.M., F.C.S.A.

185, Macquarie Street,

Sydney.

April 11, 1930.

#### Proceedings of the Australian Medical Boards.

##### VICTORIA.

THE undermentioned has been registered under the provisions of Part I of the *Medical Act*, 1928, of Victoria, as a duly qualified medical practitioner:

Leigh-Barlow, Vivian Hector, L.R.C.P. and S. (Edinburgh), L.R.F.P.S. (Glasgow), 1927, 239, Bank Street, Melbourne.

##### QUEENSLAND.

THE undermentioned have been registered under the provisions of *The Medical Act*, 1925, of Queensland, as duly qualified medical practitioners:

Haskard, Clarence Kingsley, M.R.C.S. (Eng.), L.R.C.P. (Lond.), 1928, Adavale.

Keogh, Esmond Venner, M.B., B.S., 1927 (Univ. Melbourne), Rockhampton.

Lane, Albert Stephen, M.B., 1928 (Univ. Sydney), Camooweal.

Masel, Harry, M.B., B.S., 1925 (Univ. Melbourne), Stanthorpe.

##### Restorations to the Register:

Dodson, George Hirst, M.B., Ch.M., 1921 (Univ. Sydney), Roma.

Jamieson, George Arthur, M.B., B.S., 1925 (Univ. Melbourne), Longreach.

Dive, Wilfred Royle, M.B., 1921 (Univ. Sydney), Killarney.

McCann, Francis Bede, M.B., Ch.M., 1922 (Univ. Sydney), Commonwealth Health Department, Brisbane.

O'Neill, Vennard Francis Aloysius, M.B., Ch.M., 1918 (Univ. Sydney), Townsville.

##### Registration of additional qualification:

Russell, Eustace, M.D., 1929 (Univ. Edin.), M.R.C.P. (Edin.), 1930, Brisbane.

#### LISTS OF MEMBERS.

THE lists of members of the several Branches of the British Medical Association in Australia are now available. Copies can be purchased from the office of THE MEDICAL JOURNAL OF AUSTRALIA at one shilling each.

## NOTICE.

THE Registrar of the University of Melbourne has announced that the Beattie Smith Lectures will be delivered by Professor W. S. Dawson, of the University of Sydney, in the lecture theatre of the Anatomy Department of the University of Melbourne on the evenings of May 5 and 6, 1930.

## Books Received.

**GETTING WELL AND STAYING WELL: A BOOK FOR TUBERCULOUS PATIENTS, PUBLIC HEALTH NURSES, AND DOCTORS**, by John Potts, M.D., with an introduction by J. B. McKnight, M.D.; Second Edition; 1930. St. Louis: The C. V. Mosby Company; Melbourne: Stirling and Company. Demy 8vo, pp. 221. Price: \$2.00 net.

**AIDS TO FORENSIC MEDICINE AND TOXICOLOGY**, by W. G. A. Robertson, M.D., D.Sc., F.R.C.P.E.; Tenth Edition; 1929. London: Baillière, Tindall and Cox. Crown 8vo, pp. 186. Price: 3s. 6d. net.

## Diary for the Month.

- MAY 1.—South Australian Branch, B.M.A.: Council.  
 MAY 2.—Queensland Branch, B.M.A.: Branch (Bancroft Memorial Lecture).  
 MAY 6.—New South Wales Branch, B.M.A.: Organization and Science Committee.  
 MAY 6.—New South Wales Branch, B.M.A.: Post-Graduate Work Committee.  
 MAY 6.—New South Wales Branch, B.M.A.: Hospitals Committee.  
 MAY 7.—Victorian Branch, B.M.A.: Branch.  
 MAY 8.—New South Wales Branch, B.M.A.: Clinical Meeting.  
 MAY 8.—Victorian Branch, B.M.A.: Council.  
 MAY 9.—Queensland Branch, B.M.A.: Council.  
 MAY 12.—Queensland Branch, B.M.A.: Medical Section.  
 MAY 13.—New South Wales Branch, B.M.A.: Ethics Committee.  
 MAY 20.—New South Wales Branch, B.M.A.: Executive and Finance Committee.  
 MAY 23.—Queensland Branch, B.M.A.: Council.  
 MAY 27.—New South Wales Branch, B.M.A.: Medical Politics Committee.

## Medical Appointments.

Dr. H. J. C. Hanrahan (B.M.A.) has been appointed District Medical Officer and Public Vaccinator at Gnowangerup, Western Australia, for a period of twelve months from January 1, 1930.

Dr. G. R. Osborn (B.M.A.) has been appointed Government Medical Officer in accordance with the provisions of Section 3 of *The Miner's Phthisis Act*, 1922, Western Australia.

Dr. A. Walters (B.M.A.) has been appointed Medical Officer of Health by the Kondinin Road Board, Western Australia.

## Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes*, sought, etc., see "Advertiser," page xiv.

- BROKEN HILL AND DISTRICT HOSPITAL, NEW SOUTH WALES: Temporary Resident Medical Officer.  
 CHILDREN'S HOSPITAL, INCORPORATED, PERTH, WESTERN AUSTRALIA: Junior Resident Medical Officers.  
 MARYBOROUGH HOSPITALS BOARD, QUEENSLAND: Junior Resident Medical Officer.  
 ROYAL NORTH SHORE HOSPITAL OF SYDNEY: Surgical Registrar.  
 THE BAKER INSTITUTE, ALFRED HOSPITAL, PRAHRAN, VICTORIA: Medical Vacancy.  
 THE UNIVERSITY OF SYDNEY: Pathologist.

## Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.I.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 21, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company, Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Mount Isa Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Medical practitioners are requested not to apply for appointments to positions at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of *THE MEDICAL JOURNAL OF AUSTRALIA*, The Printing House, Seamer Street, Glebe, New South Wales.

## Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to *THE MEDICAL JOURNAL OF AUSTRALIA* alone, unless the contrary be stated.

All communications should be addressed to "The Editor," *THE MEDICAL JOURNAL OF AUSTRALIA*, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

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